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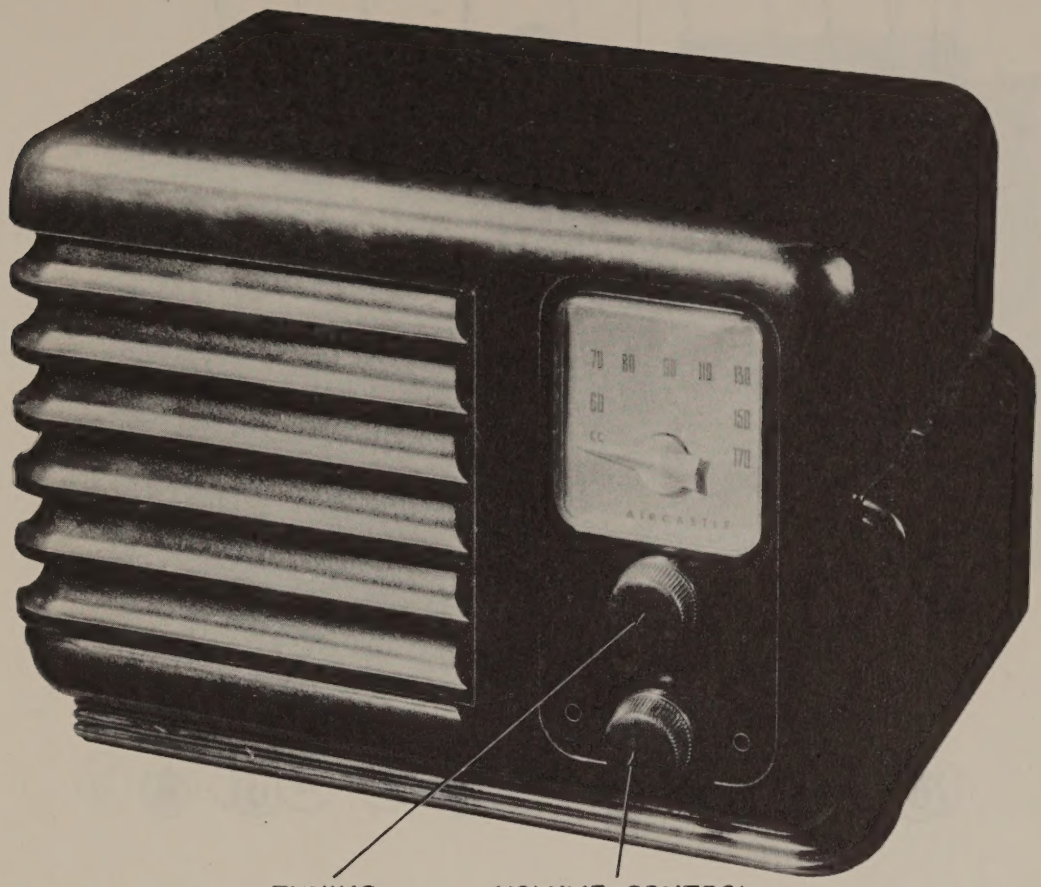
TRADE NAME	MODEL	SET AND FOLDER NO.
Aircastle	227I, 227W	84-1
Altec Lansing	ALC-101, A-323C	84-2
Arvin	341T (Ch. RE-274)	84-3
Bendix	2001, 2002, 2020, 2021, 3001, 3002, 3030, 3031 Tel. Rec.	84-4
David Bogen	HO50	84-5
Emerson	608A (Ch. 120089B), 626 (Ch. 120104B, 120104BJ) Tel. Rec.	84-6
Howard	475TV Tel. Rec.	Photofact Servicer
Magnecord	AD-1R Recorder	84-7
Markel	70, 71 (Record Changer)	84-8
Silvertone	8073 (Ch. 135.243)	84-9
Silvertone	9131 (Ch. 478.210) Tel. Rec.	84-10
Trav-Ler	7016, 7017	84-11
V-M	800D Record Changer	84-12
Westinghouse	H-196A (DX) (Ch. V-2130-11DX or V-2130-12DX), H-207A (DX) (Ch. V-2130-11DX or V-2130-12DX and Radio Ch. V-2137), H-207B (DX) (Ch. V-2130-21DX or V-2130-22DX and Radio Ch. V-2137), H-225 (DX) (Ch. V-2130-31DX or V-2130-32DX) Tel. Rec.	84-13
Zenith	G510, G510Y (Ch. 5G02)	84-14

AIRCASTLE
MODELS 2271, 227W



AIRCASTLE
MODELS 2271, 227W

TRADE NAME	Aircastle, Models 2271, 227W
SUPPLIER	Spiegel, Inc., 1061 W. 35th St., Chicago, Illinois
TYPE SET	AC-DC Operated Superheterodyne Receiver
TUBES (FOUR)	Types 12BE6 Converter, 12AT6 or 12AV6 DET-AVC-AF, 50B5 Power Output, 35W5 Rectifier
POWER SUPPLY	105-125 Volts AC-DC RATING: .27 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1700KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer parallel with base of dial.

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to stator on ant. section of tuning gang. Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	.05MFD	"	1720KC	"	"	A3	"
3.	50MMF	High side to ant. terminal on ant. coil. Low side to B-.	1400KC	Tune for max. output	"	A4	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		AIRCASTLE PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2A	DET.-AVC-AF	12AT6	12AT6	7BT	
B	DET.-AVC-AF	12AV6	12AV6	7BT	
V3	Power Output	50B5	50B5	7BZ	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	AIRCASTLE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150		PRS150/40-40	EDL4415		TA-440	Filter Red, See Note
B	40	150						Filter Red, See Note
C2	.02	200	CP-12203	P488-02	GT2S2		TM-12	AVC Filter
C3	250	500	CM-25251	1468-00025	5W5T25	GP2K-250	1FM-325	Diode RF Filter
C4	.005	200	CP-12502	P688-005	GT6D5	GP2M-005	TM-25	Audio Coupling
C5	.005	200	CP-12502	P688-005	GT6D5	GP2M-005	TM-25	Audio Coupling
C6	.01	600	CP-14103	P688-01	GT6S1	GP2-335-01	TM-11	Output Plate Bypass
C7	.05	200	CP-12503	P288-05	GT2S5		TM-15	Line Filter
C8	.05	200	CP-12503	P288-05	GT2S5		72P51	Line Isolation

Note. Some models may use 30/20 MFD capacitor part #CL-10017.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	
R1A	1 Meg.	½	VC-12106-E	Q13-137		Volume control
B	Switch		Not Req.	76-1		Attach to R1A per instructions

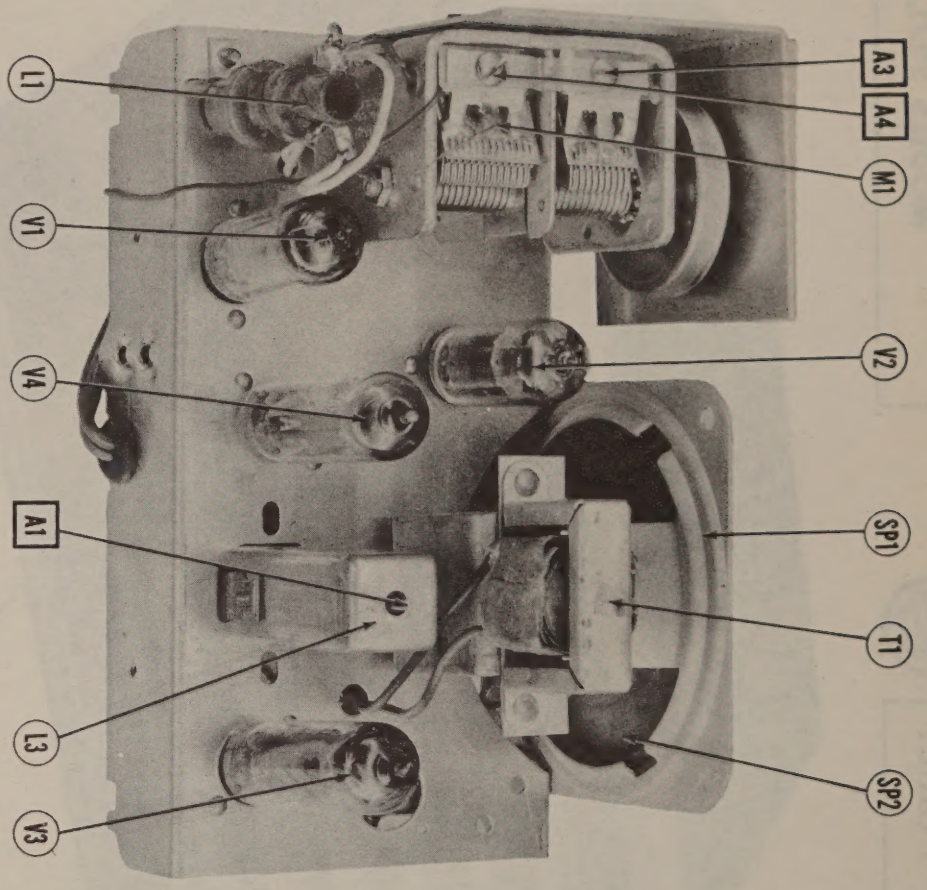
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	
R2	10KΩ	½	RC-21002	BTS-10K	Osc. Grid
R3	2.2 Meg.	½	RC-22204	BTS-2.2 Meg.	AVC Network
R4	10 Meg.	½	RC-21005	BTS-10 Meg.	AF Grid
R5	470KΩ	½	RC-24703	BTS-470K	AF Plate
R6	470KΩ	½	RC-24703	BTS-470K	Output Grid
R7	150Ω	½	RC-21500	BW-½-150	Output Cathode
R8	1000Ω	½	RC-21001	BTS-1000	Filter
R9	47Ω	1	RC-44700	BW-1-47	Filament Dropping
R10	22Ω	1	RC-40220	BW-1-22	Line Dropping

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2400Ω	3.4Ω	160Ω	.5Ω	TO-10000	A-3332	A-3025	RO-2 †	† Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.				
SP1	PM	3.4Ω			3A07 *	* Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	3 1/4"	9/16"				

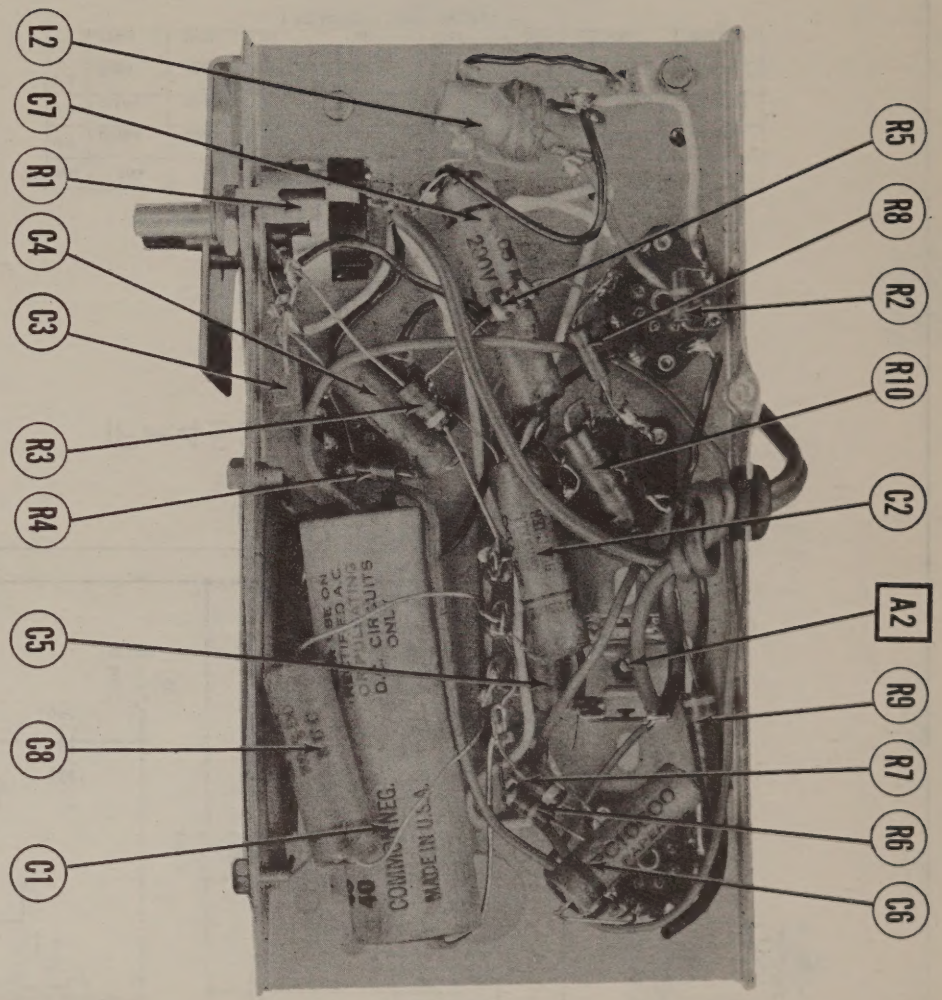
R F COILS

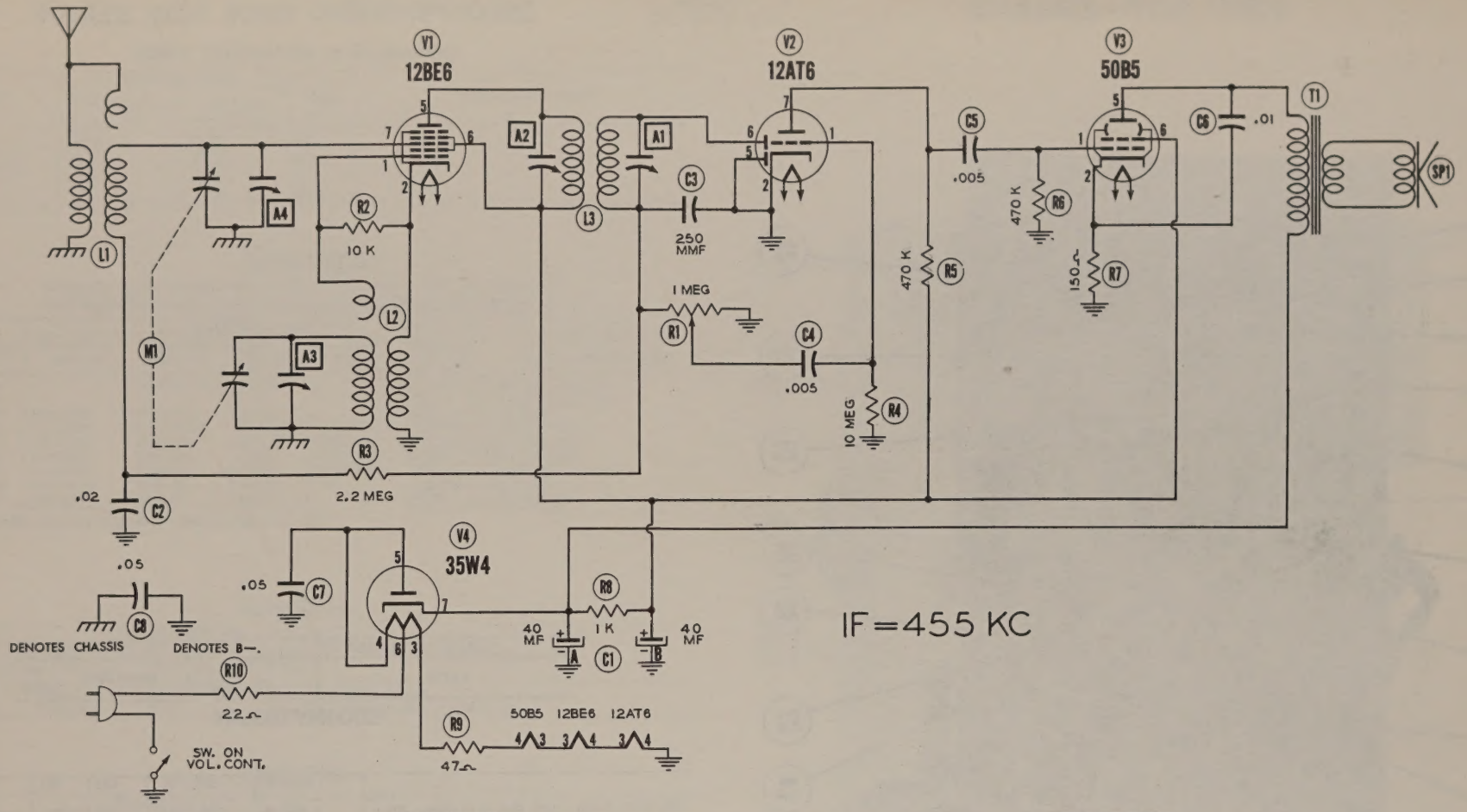
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: MEISSNER PART No.	
L1	Ant. Trans.	36Ω	5Ω	TRF-10018		
L2	Osc. Coil	.8Ω	5Ω	TRC-10015	14-1060 #	# Add 50MMF from high side of tuning cap to Osc. Grid.
L3	IF Trans.	19Ω	22Ω	TS-10039	16-6678	

MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M1	2 Gang. Var. Cap.	CV-10010	(24-464MMF, 26-208MMF)

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-5.3VDC	0V	27VAC	14VAC	80VDC	80VDC	-.3VDC
V 2	12AT6	-.8VDC	0V	14VAC	0V	0V	-.5VDC	37VDC
V 3	50B5	0V	6.8VDC	27VAC	75VAC	90VDC	80VDC	0V
V 4	35W4	117VAC	0V	80VAC	105VAC	105VAC	110VAC	110VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	10KΩ	1Ω	24Ω	12Ω	†1000Ω	†1000Ω	3.2 Meg.
V 2	12AT6	10 Meg.	0Ω	12Ω	0Ω	0Ω	1 Meg.	†470KΩ
V 3	50B5	470KΩ	150Ω	24Ω	70Ω	†150Ω	†1000Ω	470KΩ
V 4	35W4	160Ω	Inf.	118Ω	150Ω	150Ω	140Ω	70KΩ

† MEASURED FROM PIN 7 OF V4.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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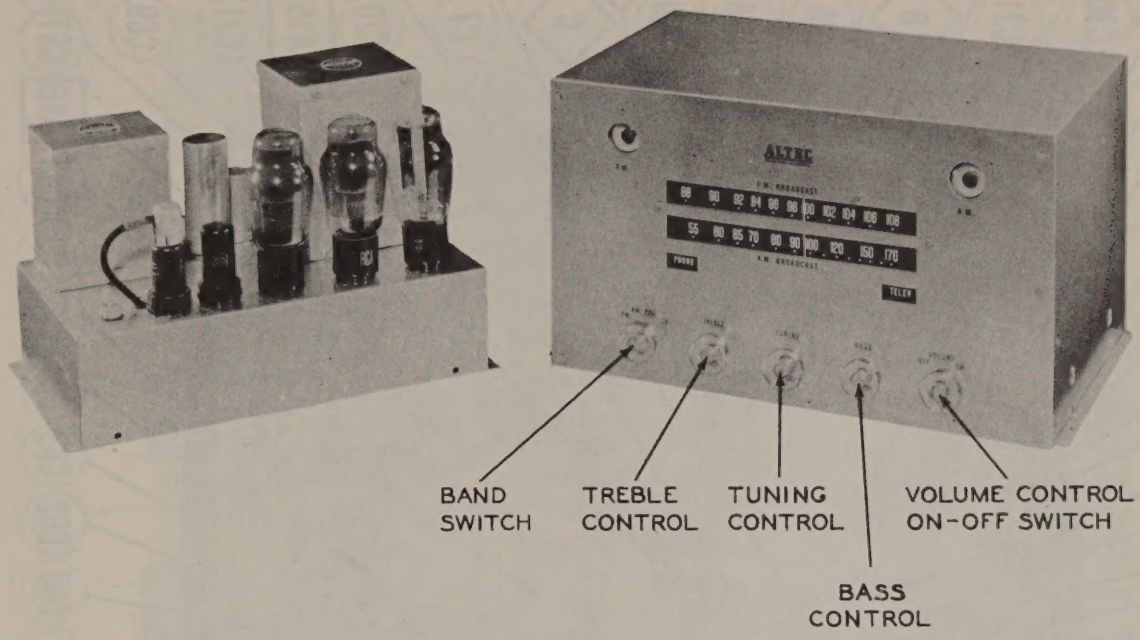
84-1

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ALTEC LANSING
MODELS ALC-101, A-323C



ALTEC LANSING
MODELS ALC-101, A-323C

TRADE NAME	Altec Lansing, Models ALC-101, A-323C	
MANUFACTURER	Altec Lansing Corp., 161 6th Ave., New York 13, New York	
TYPE SET	AC Operated AM-FM Tuner with Audio Amplifier and Power Supply	
TUBES(SEVENTEEN)	Types 12AT7 FM RF Amp.-FM Mixer, 6AU6 FM Oscillator, 6BA6 FM 1st IF, 6BA6 FM 2nd IF 6AL5 Ratio Det., 6U5/6G5 FM Tuning Ind., 6BA6 1st AM RF, 6BA6 2nd AM RF-AVC, 6U5/6G5 AM Tuning Ind., 6AU6 Det., 6J5 1st AF Amp., 6J7 Phono Pre-Amp., 6J7 2nd AF Amp., 6J5 3rd AF-Phase Inv., (2) 6L6G Power Output, 5U4G Rectifier	
POWER SUPPLY	110-120 Volts AC	RATING 1.25 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	550-1700KC	FREQ. MOD. 88-108MC

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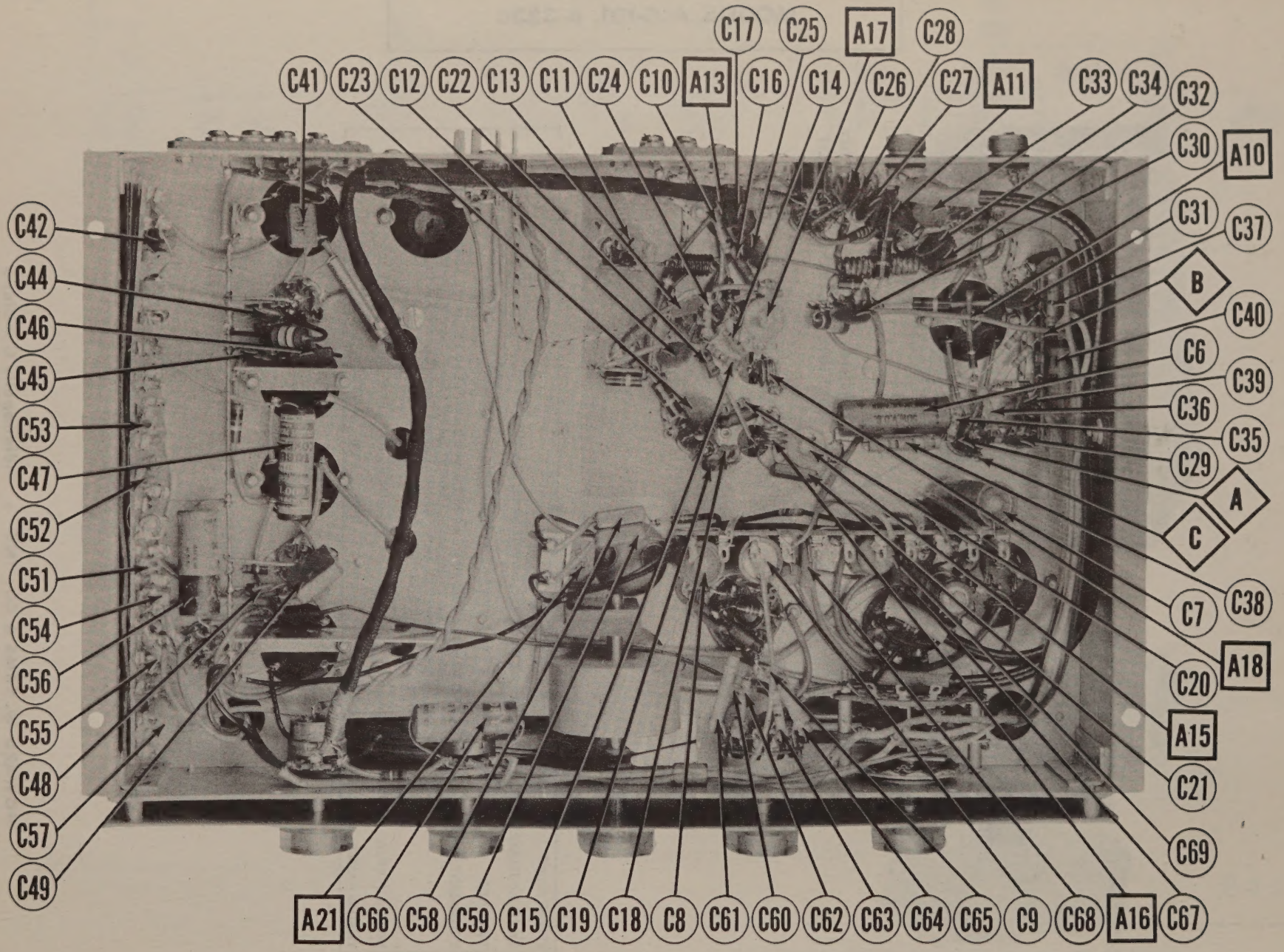
C17
C25
A17
C28
C41
C23
C12
C22
C13
C11
C24
C10
A13
C16
C14
C26
C27
A11
C33
C34
C32
C30
A10
C31
C37
B
C40
C6
C39
C36
C35
C29
A
C
C38
C7
A18
C20
A15
C21
C69
C42
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A21
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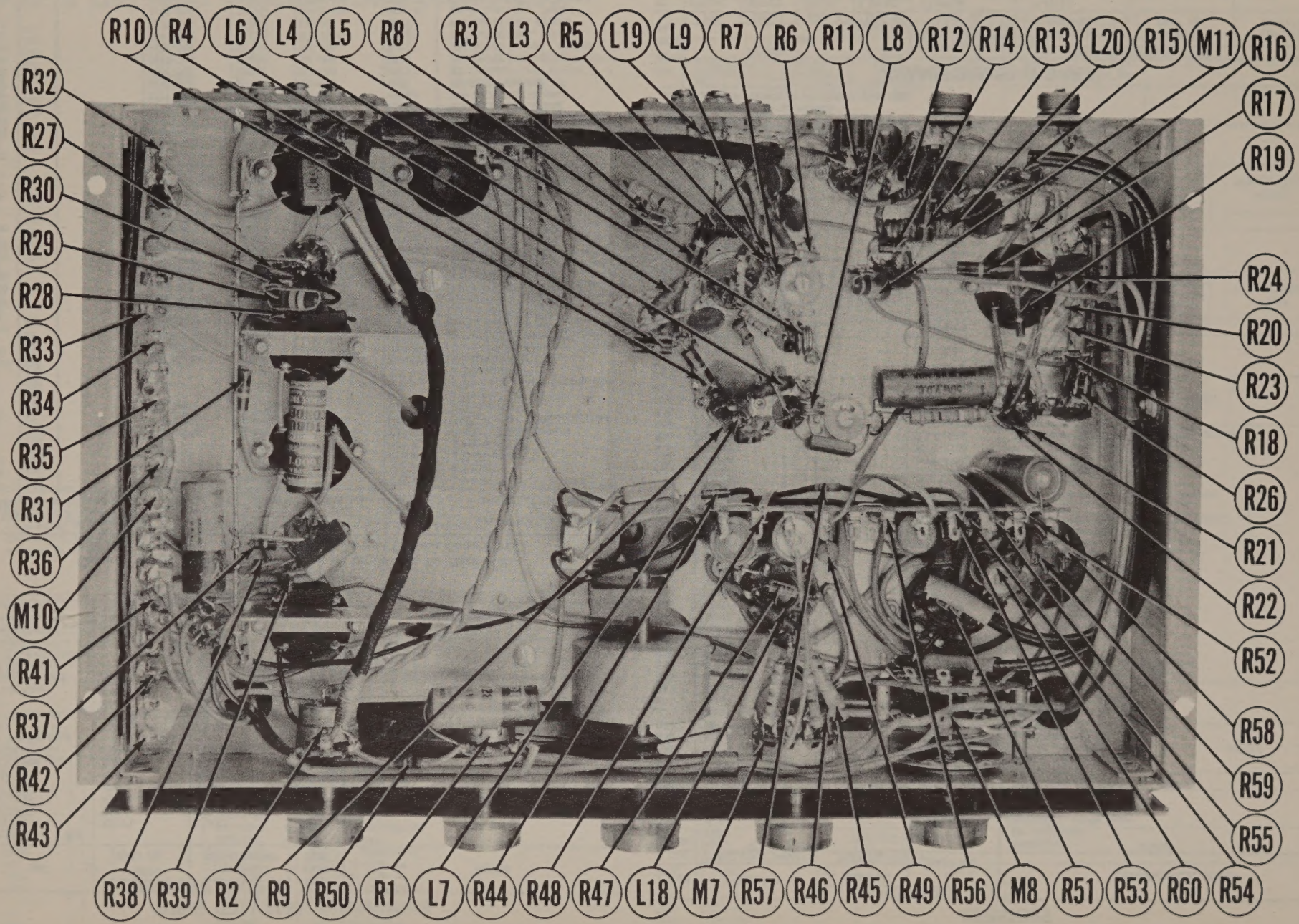
C62
C63
C64
C65
C9
C68
A16
C67


R10
R4
L6
L4
L5
R8
R3
L3
R5
L19
L9
R7
R6
R11
L8
R12
R14
R13
L20
R15
M11
R16
R17
R19
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R31
R36
M10
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R18
R26
R21
R22
R52
R58
R59
R55
R38
R39
R2
R9
R50
R1
L7
R44
R48
R47
L18
M7
R57
R46
R45
R49
R56
M8
R51
R53
R60
R54

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA A. LANSING PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	FM RF Amp.- FM Mixer	12AT7	12AT7	9A	
V2	FM Osc.	6AU6	6AU6	7BK	
V3	FM 1st IF	6BA6	6BA6	7BK	
V4	FM 2nd IF	6BA6	6BA6	7BK	
V5	Ratio Det.	6AL5	6AL5	6BT	
V6	FM Tuning Ind.	6U5/6G5	6U5/6G5	6R	
V7	AM 1st RF	6BA6	6BA6	7BK	
V8	AM 2nd RF Amp.- AVC	6BA6	6BA6	7BK	
V9	AM Tuning Ind.	6U5/6G5	6U5/6G5	6R	
V10	Det.	6AU6	6AU6	7BK	
V11	1st AF Amp.	6J5	6J5	6Q	
V12	Phono Pre Amp.	6J7	6J7	7R	
V13	2nd AF Amp.	6J7	6J7	7R	
V14	3rd AF Amp.-Phase Inverter	6J5	6J5	6Q	
V15	Power Output	6L6G	6L6G	7AC	
V16	Power Output	6L6G	6L6G	7AC	
V17	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA A. LANSING PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	500		AF88K	UP4450		TVL-20	▲ Filter
B	40	500						■ Filter
C2A	10	450		AF22J	UP1145		EL-210	■ Decoupling
B	10	450						▲ Decoupling
C3	50	50		PRS50/50	BR505		TA-550	Output Cathode Bypass
C4	100	25		PRS25/100	BRH251A		UHC-102	2nd AF Amp. Cathode Bypass
C5A	20	450		AF4444J	UP222245		EL-420	Decoupling
B	20	450						▲ Decoupling
C	20	450						■ Phono Pre-Amp Screen Byp.
D	20	450						▲ Decoupling
C6	25	50		PRS50/25	BR255A		TA-525	Stabilizing Cap.
C7	50	25		PRS25/50	BR502		TA-50	Phono Pre-Amp. Cath. Bypass
C8	50	25		PRS25/50	BR502		TA-50	1st AF Amp. Cath. Bypass
C9	8	250		PRS250/8	BR825		UT-82	Audio Coupling
C10	100			1468-0001	5W5T1	GP1K-100	1FM-31	Ant. Coupling
C11	500			1468-0005	5W5T5	GP2K-500	1FM-35	FM RF Cath. Bypass
C12	5000			1467-005	1D5D5	811-005	29C1	FM RF Plate Decoupling
C13	5000			1467-005	1D5D5	811-005	29C1	FM RF Fil. Bypass
C14	100			1468-0001	5W5T1	GP1K-100	1FM-31	RF Coupling
C15	100			1468-0001	5W5T1	GP1K-100	1FM-31	RF Coupling
C16	100			1469-0001	5R5T1	NPOM-100	MS-31	Fixed Trimmer
C17	5000			1467-005	1D5D5	811-005	29C1	Mixer Plate Decoupling
C18	30			1468-00004	5W5Q3	GP1K-33	MS-43	Osc. Grid Cap.
C19	30						MS-43	Osc. Feedback
C20	100			1468-0001	5W5T1	GP1K-100	1FM-31	Osc. Feedback
C21	5	500		1469-000005	5R5V5	NPOK-5	MS-55	Fixed Trimmer Note 1
C22	1			1468-000001				Osc. Coupling See Note 2
C23	5000			1467-005	1D5D5	811-005	29C1	Osc. Filament Bypass
C24	150			1468-00015	5W5T15	GP2K-150	1FM-315	AVC Filter
C25	5000			1467-005	1D5D5	811-005	29C1	AVC Filter
C26	5000			1467-005	1D5D5	811-005	29C1	FM 1st IF Screen Bypass
C27	5000			1467-005	1D5D5	811-005	29C1	FM 1st IF Decoupling
C28	5000			1467-005	1D5D5	811-005	29C1	FM 1st IF Fil. Bypass
C29	5000			1467-005	1D5D5	811-005	29C1	DAVC Decoupling
C30	5000			1467-005	1D5D5	811-005	29C1	RF Bypass
C31	5000			1467-005	1D5D5	811-005	29C1	FM 2nd IF Decoupling
C32	5000			1467-005	1D5D5	811-005	29C1	FM 2nd IF Screen Bypass
C33	5000			1467-005	1D5D5	811-005	29C1	FM 2nd IF Cath. Bypass
C34	5000			1467-005	1D5D5	811-005	29C1	FM 2nd IF Fil. Bypass
C35	100			1468-0001	5W5T1	GP1K-100	1FM-31	Diode Load Cap. Note 3
C36	100			1468-0001	5W5T1	GP1K-100	1FM-31	Diode Load Cap. Note 3
C37	2000			1467-002	1W5D2	GP2M-002	1FM-22	De-emphasis
C38	500			1468-0005	5W5T5	GP2K-500	1FM-35	DAVC Decoupling
C39	5000			1467-005	1D5D5	811-005	29C1	Ratio Det. Fil. Bypass

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA A. LANSING PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES
R19	220Ω	½			Balancing
R20	47KΩ	½		BTS-47K	De-emphasis
R21	1800Ω	½		BTS-1800	Ratio Det. Diode Load
R22	1800Ω	½		BTS-1800	Ratio Det. Diode Load
R23	2.2 Meg.	½		BTS-2.2 Meg.	FM Tuning Ind. Network
R24	2.2 Meg.	½		BTS-2.2 Meg.	FM Tuning Ind. Grid
R25	1 Meg.	½		BTS-1 Meg.	FM Tuning Ind. Plate
R26	1 Meg.	½		BTS-1 Meg.	Tone Compensation
R27	82Ω	½		BW-½-82	1st AM RF Cathode
R28	47KΩ	½		BTS-47K	1st AM RF Screen
R29	24KΩ 5%	2			Voltage Divider See Note 1
R30	56KΩ	½		BTS-56K	Voltage Divider See Note 1
R31	1000Ω	1		BTA-1000	1st AM RF Decoupling
R32	100KΩ	½		BTS-100K	AVC Network
R33	100KΩ	½		BTS-100K	AVC Network
R34	470KΩ	½		BTS-470K	AVC Network
R35	4.7 Meg.	½		BTS-4.7 Meg.	AVC Network
R36	750KΩ	½			AVC Network
R37	68Ω	½		BW-½-68	2nd AM RF Cathode
R38	68KΩ	½		BTS-68K	Voltage Divider See Note 1
R39	47KΩ	½		BTS-47K	2nd AM RF Screen
R40	1 Meg.	½		BTS-1 Meg.	AM Tuning Ind. Plate
R41	100KΩ	½		BTS-100K	AM Det. Filter
R42	10KΩ	½		BTS-10K	AM Det. Filter
R43	1 Meg.	½		BTS-1 Meg.	Tone Compensation
R44	62KΩ	½		BTS-68K	Tone Compensation
R45	100KΩ	½		BTS-100K	Tone Compensation
R46	100KΩ	½		BTS-100K	Tone Compensation
R47	470KΩ	½		BTS-470K	1st AF Grid
R48	510Ω	½		BTS-470	1st AF Cathode
R49	30KΩ	2		BT-2-33K	1st AF Plate
R50	1000Ω	½		BTS-1000	Tone Compensation
R51	470KΩ	½		BTS-470K	Phono Pre Amp Grid
R52	2200Ω	½		BTS-2200	Phono Pre Amp Cathode
R53	100KΩ	½		BTS-100K	Phono Pre Amp Plate
R54	150KΩ	½		BTS-150K	Phono Pre Amp Plate
R55	1 Meg.	½		BTS-1 Meg.	Phono Pre Amp Screen
R56	18KΩ	½		BTS-18K	Tone Compensation
R57	1 Meg.	½		BTS-1 Meg.	Tone Compensation
R58	47KΩ	½		BTS-47K	Decoupling
R59	5100Ω	1			Filter See Note 1
R60	2500Ω	20		DG-2500	Filter, Wire Wound
R61	470KΩ	½		BTS-470K	2nd AF Grid
R62	1000Ω	½		BTS-1000	2nd AF Cathode
R63	100Ω	½		BW-½-100	2nd AF Cathode-Wire Wound
R64	240KΩ 5%	½			2nd AF Plate
R65	1 Meg.	½		BTS-1 Meg.	2nd AF Screen
R66	20KΩ	½		BTS-22K	Tone Compensation See Note 2
R67	1 Meg.	½		BTS-1 Meg.	3rd AF Grid
R68	2200Ω	½		BTS-2200	3rd AF Cathode
R69	47KΩ	½		BTS-47K	3rd AF Cathode
R70	47KΩ	½		BTS-47K	3rd AF Plate
R71	10KΩ	½		BTS-10K	Decoupling
R72	240KΩ 5%	½			Output Grid
R73	240KΩ 5%	½			Output Grid
R74	250Ω	10		AB-250	Output Cathode-Wire Wound
R75	3900Ω	½		BTS-3900	Feedback
R76	250Ω	10		AB-250	Filter-Wire Wound
R77	100Ω	1		BW-1-100	Isolation-Wire Wound, See Note 2
R78	1000Ω	½		BTS-1000	Tone Compensation See Note 3

Note 1. Not used in early production models.
Note 2. Not used in all models.
Note 3. Used in early production models only.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ALTEC LANSING PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.
T1	117VAC at 1.25A	760VCT .134ADC	5VAC at 3A	6.3VAC at 6.3A	TJ-604B	P-6315 †		

† Drill new mounting holes.

PARTS LIST AND DESCRIPTIONS (Continued)

C40	.1	400		P488-1	GT4P1		TM-1	Audio Coupling
C41	100	500		1469-0001	5R5T1	NPOM-100	MS-31	Fixed Trimmer
C42	.05	400		P488-05	GT4S5		TM-15	AVC Filter
C43	.1	200		P288-1	GT2P1		TM-1	AM 1st RF Cath. Bypass Note 4
C44	5000			1467-005	1D5D5	811-005	29C1	AM 1st RF Screen Bypass
C45	5000			1467-005	1D5D5	811-005	29C1	AM 1st RF Decoupling
C46	50	500		1469-00005	5R5Q5	NPOM-50	MS-45	Fixed Trimmer Note 2
C47	.03	600		P688-03	GT6S3		TM-13	AVC Filter
C48	5000			1467-005	1D5D5	811-005	29C1	AM 2nd RF Screen Bypass
C49	1000	500		1468-001	1W5D1	GP2L-001	1FM-21	AM 2nd RF Screen Bypass See Note 2
C50	20	500			5R5Q2	NPOK-20	MS-42	Fixed Trimmer See Note 5
C51	50			1468-00005	5W5Q5	GP1K-50	1FM-45	RF Coupling
C52	1000			1468-001	1W5D1	GP2L-001	1FM-21	AVC Filter
C53	500			1468-0005	5W5T5	GP2K-500	1FM-35	AVC Filter
C54	500	500		1468-0005	5W5T5	GP2K-500	1FM-35	AM Det. RF Filter
C55	500			1468-0005	5W5T5	GP2K-500	1FM-35	AM Det. RF Filter
C56	.1	600		P688-1	GT6P1		TM-1	AM Det. Plate Bypass
C57	.1	400		P488-1	GT4P1		TM-1	Audio Coupling
C58	2500	500		1467-0025	1W5D25	GP2M-0025	1FM-225	Tone Compensation
C59	2500	500		1467-0025	1W5D25	GP2M-0025	1FM-225	Tone Compensation
C60	200			1468-0002	5W5T2	GP2K-200	1FM-32	Tone Compensation
C61	500			1468-0005	5W5T5	GP2K-500	1FM-35	Tone Compensation
C62	1000			1468-001	1W5D1	GP2L-001	1FM-21	Tone Compensation
C63	2000			1467-002	1W5D2	GP2M-002	1FM-22	Tone Compensation
C64	500			1468-0005	5W5T5	GP2K-500	1FM-35	Tone Compensation
C65	1000			1468-001	1W5D1	GP2L-001	1FM-21	Tone Compensation
C66	.1	400		P488-1	GT4P1		TM-1	Tone Compensation See Note 2
C67	1500	500		1467-0015	1W5D15	GP2L-0015	1FM-215	Tone Compensation
C68	10000	300		1467-01	1D3S1	GP2-335-01	1FM-11	Tone Compensation
C69	.1	400		P488-1	GT4P1		TM-1	Audio Coupling
C70	.1	600		P688-1	GT6P1		TM-1	Audio Coupling
C71	.1	600		P688-1	GT6P1		TM-1	2nd AF Screen Bypass
C72	.05	600		P688-05	GT6S5		TM-15	Audio Coupling
C73	100	500		1468-0001	5W5T1	GP1K-100	1FM-31	Tone Compensation See Note 5
C74	.1	600		P688-1	GT6P1		TM-1	Audio Coupling
C75	.1	600		P688-1	GT6P1		TM-1	Audio Coupling
C76	.05	600		P688-05	GT6S5		TM-15	Line Filter
C77	.05	600		P688-05	GT6S5		TM-15	Line Filter
C78	.1	400		P488-1	GT4P1		TM-1	AM 2nd RF Cath. Bypass Note 4

Note 1. Early production models use 2MMF in this application.
Note 2. Used only in late production models.
Note 3. When either item C35 or C36 are replaced, replace both with capacitors of equal value.
Note 4. Used only in early production models.
Note 5. Not used in all models.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	A. LANSING PART No.	IRC PART No.	CLAROSTAT PART No.	
R1	500KΩ	½		Q13-133	M-60-Z	Bass Control
R2A	10KΩ	½		Q13-116	M-81-Z	Volume Control
B	Switch			76-1	SW-A	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	A. LANSING PART No.	IRC PART No.	
R3	220Ω	½			FM RF Cathode
R4	1000Ω	1		BTA-1000	FM RF Decoupling
R5	470KΩ	½		BTS-470K	FM RF Grid
R6	2.2 Meg.	½		BTS-2.2 Meg.	AVC Network
R7	470KΩ	½		BTS-470K	FM Mixer Grid
R8	1000Ω	1		BTA-1000	FM Mixer Decoupling
R9	22KΩ	½		BTS-22K	FM Osc. Grid
R10	1000Ω	1		BTA-1000	FM Osc. Decoupling
R11	68Ω	½			1st FM IF Cathode
R12	33KΩ	½		BTS-33K	1st FM IF Screen
R13	1000Ω	1		BTA-1000	1st FM IF Decoupling
R14	5.1 Meg.	½		BTS-4.7 Meg.	Delayed AVC
R15	68Ω	½			2nd FM IF Cathode
R16	18KΩ	½		BTS-18K	2nd FM IF Screen
R17	1000Ω	1		BTA-1000	2nd FM IF Decoupling
R18	220KΩ	½		BTS-220K	AVC Network

SET 84 FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ALTEC LANSING PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5.3KΩ CT	2.5-5Ω 8-12Ω 16-24Ω	280Ω CT	.2Ω .8Ω 1.0Ω	TL-217B				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ALTEC LANSING PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1		148Ω		TA328				

TONE CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ALTEC LANSING PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L2		610Ω		TA327				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ALTEC LANSING PART No.	MEISSNER PART No.	
L3	FM Ant.	0Ω		61868		10 turns wire on 1.5KΩ resistor
L4	RF Choke	1.7Ω		61867		
L5	FM RF	0Ω		61870		
L6	Cath. Choke	1.7Ω		61867		
L7	Parasitic Suppressor	0Ω		61872		2 turns wire on 22Ω resistor
L8	FM Osc.	0Ω		61877		
L9	Plate Choke	0Ω		61870		4 turns wire on 820Ω resistor
L10	1st FM IF	1Ω	.2Ω	61864		Red dot
L11	2nd FM IF	1Ω	1Ω	61865		Green dot
L12	Ratio Det. Transformer	1Ω	0Ω	61866		Orange dot
L13	Wave Trap	0Ω				
L14	AM Ant. Transformer	52Ω	3Ω	61948		Blue dot
L15	1st RF Trans.	75Ω	3Ω	61950		Yellow dot
L16	RF Grid	3Ω		61949		Brown dot
L17	2nd RF Trans.	110Ω	3Ω	61950		Yellow dot
L18	Tone Choke	1.7Ω		61867		
L19	Fil. Choke	0Ω				5 turns wire, 3/16" dia.
L20	Fil. Choke	0Ω				13 turns wire 3/16" dia.

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					ALTEC LANSING PART No.		
M1-M6	Bayonet	6-8	.25	Blue			Type #44

MISCELLANEOUS

ITEM No.	PART NAME	ALTEC LANSING PART No.	NOTES
M7	Switch		Tone
M8	Switch		Function
M9	Fuse		1.5 Amp.
M10	Crystal		1N34
M11	Crystal		1N34
M12	AM Tuning Gang		4 Gang (24-405MMF) Each Section
M13	FM Tuning Gang		

VOLTAGE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V 1	12AT7	180VDC	§-1VDC	0V	6.3VAC	6.3VAC	180VDC	0V	1.7VDC	0V
†	V 2	6AU6	-.2VDC	0V	0V	6.3VAC	180VDC	180VDC	0V		
†	V 3	6BA6	0V	0V	0V	6.3VAC	180VDC	75VDC	.6VDC		
†	V 4	6BA6	0V	0V	0V	6.3VAC	175VDC	95VDC	.9VDC		
†	V 5	6AL5	-.2VDC	.5VDC	0V	6.3VAC	0V	0V	-.5VDC		
†	V 6	6U5/6G5	6.3VAC	13.5VDC	-.8VDC	192VDC	0V	0V			
	V 7	6BA6	-.4VDC	0V	0V	6.3VAC	300VDC	50VDC	.3VDC		
	V 8	6BA6	-.7VDC	0V	0V	6.3VAC	300VDC	90VDC	.7VDC		
	V 9	6U5/6G5	6.3VAC	19.5VDC	-.6VDC	315VDC	0V	0V			
	V 10	6AU6	0V	10VDC	0V	6.3VAC	310VDC	310VDC	10VDC		
	V 11	6J5	0V	0V	135VDC	0V	0V	0V	6.3VAC	3.7VDC	
♦	V 12	6J7	0V	0V	82VDC	50VDC	2VDC	0V	6.3VAC	2VDC	
	V 13	6J7	0V	0V	65VDC	37VDC	1.4VDC	0V	6.3VAC	1.4VDC	
	V 14	6J5	0V	0V	173VDC	0V	168VDC	158VDC	6.3VAC	167VDC	
	V 15	6L6G	0V	0V	370VDC	380VDC	.3VDC	0V	6.3VAC	28VDC	
	V 16	6L6G	0V	0V	370VDC	380VDC	.3VDC	0V	6.3VAC	28VDC	
	V 17	5U4G	0V	400VDC	0V	350VAC	0V	350VAC	0V	400VDC	

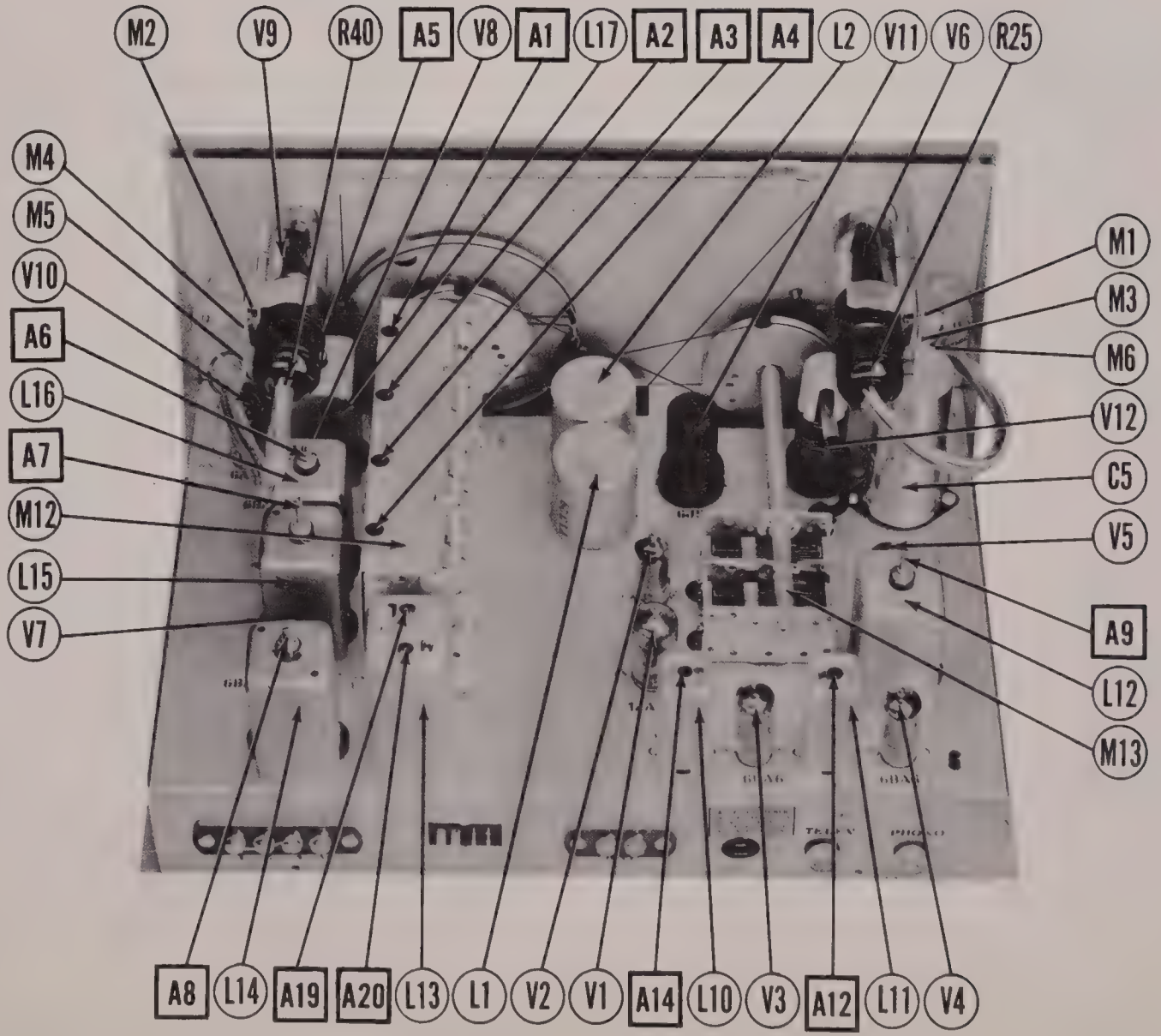
§ TAKEN IN VACUUM TUBE VOLTMETER.
† TAKEN IN FM POSITION.
♦ TAKEN IN PHONO POSITION.

RESISTANCE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V 1	12AT7	†3.8KΩ	470KΩ	0Ω	.1Ω	.1Ω	†3.8KΩ	470KΩ	220Ω	0Ω
†	V 2	6AU6	22KΩ	2Ω	0Ω	.1Ω	†3.8KΩ	†3.8KΩ	2Ω		
†	V 3	6BA6	470KΩ	0Ω	0Ω	.1Ω	†3.8KΩ	†33KΩ	68Ω		
†	V 4	6BA6	1Ω	0Ω	0Ω	.1Ω	†3.8KΩ	†21KΩ	68Ω		
†	V 5	6AL5	Inf.	Inf.	0Ω	.1Ω	0Ω	9Ω	3.6KΩ		
†	V 6	6U5/6G5	.1Ω	†1 Meg.	2.2 Meg.	†2.8KΩ	0Ω	0Ω			
	V 7	6BA6	6 Meg.	0Ω	0Ω	.1Ω	†3.8KΩ	†40KΩ	82Ω		
	V 8	6BA6	6 Meg.	0Ω	0Ω	.1Ω	†2.8KΩ	†40KΩ	68Ω		
	V 9	6U5/6G5	.1Ω	†1 Meg.	1.8 Meg.	†2.8KΩ	0Ω	0Ω			
	V 10	6AU6	3Ω	110KΩ	0Ω	.1Ω	†2.8KΩ	†2.8KΩ	110KΩ		
	V 11	6J5	0Ω	0Ω	†35KΩ	Inf.	470KΩ	Inf.	.1Ω	500Ω	
	V 12	6J7	0Ω	0Ω	†300KΩ	†180KΩ	2.2KΩ	470KΩ	.1Ω	2.2KΩ	
	V 13	6J7	0Ω	0Ω	†250KΩ	†1 Meg.	1.1KΩ	470KΩ	.1Ω	1.1KΩ	
	V 14	6J5	0Ω	0Ω	†57KΩ	Inf.	1 Meg.	47KΩ	.1Ω	50KΩ	
	V 15	6L6G	Inf.	0Ω	†380Ω	†240Ω	240KΩ	Inf.	.1Ω	250Ω	
	V 16	6L6G	Inf.	0Ω	†380Ω	†240Ω	240KΩ	Inf.	.1Ω	250Ω	
	V 17	5U4G	Inf.	70KΩ	Inf.	80Ω	Inf.	68Ω	Inf.	70KΩ	

† TAKEN IN FM POSITION.
♦ TAKEN IN PHONO POSITION.
† MEASURED FROM PIN 8 OF V17.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.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R40
A5
V8
A1
L17
A2
A3
A4
L2
V11
V6
R25
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V10
A6
L16
A7
M12
L15
V7
M1
M3
M6
V12
C5
V5
A9
L12
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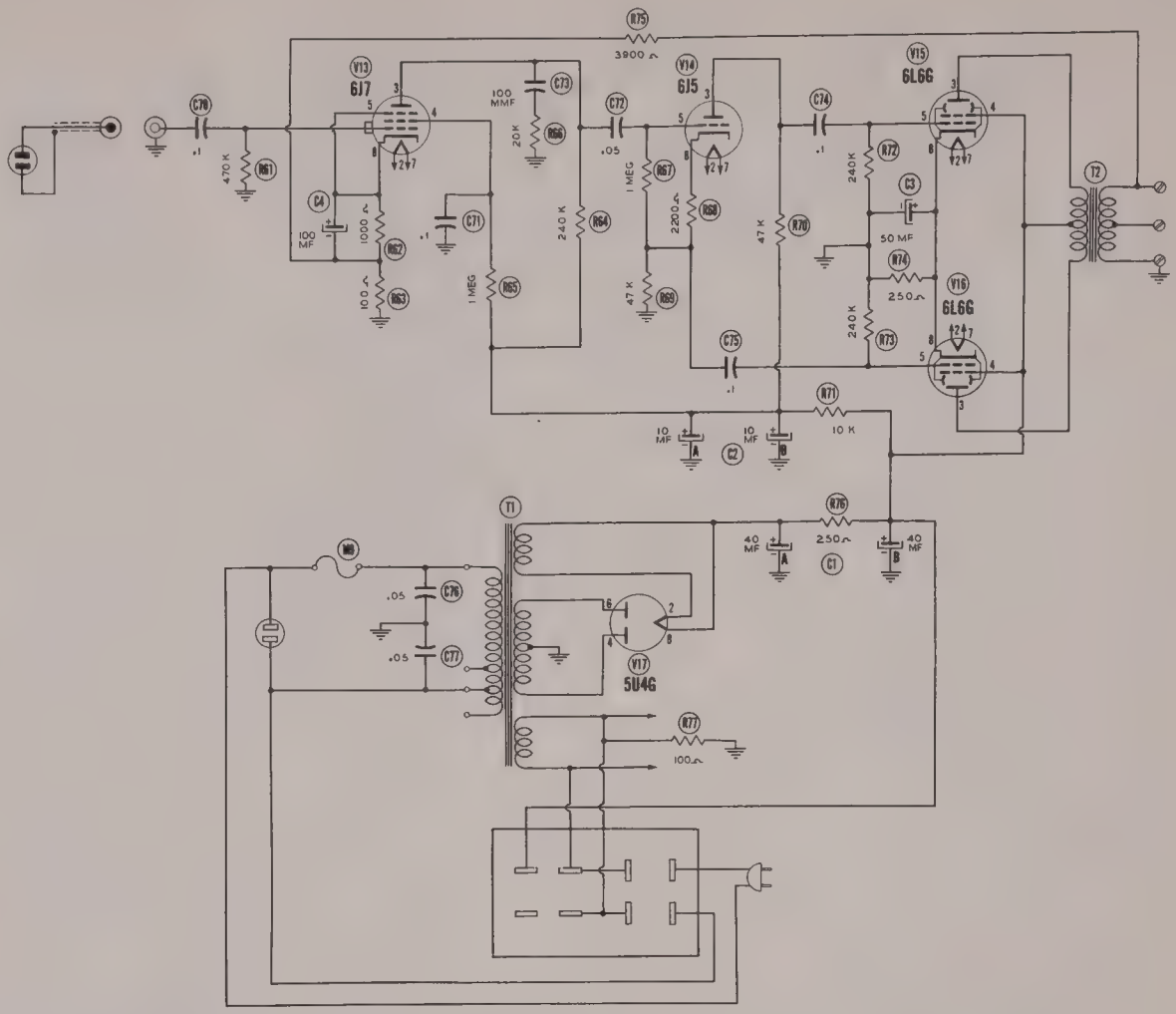
L11
V4



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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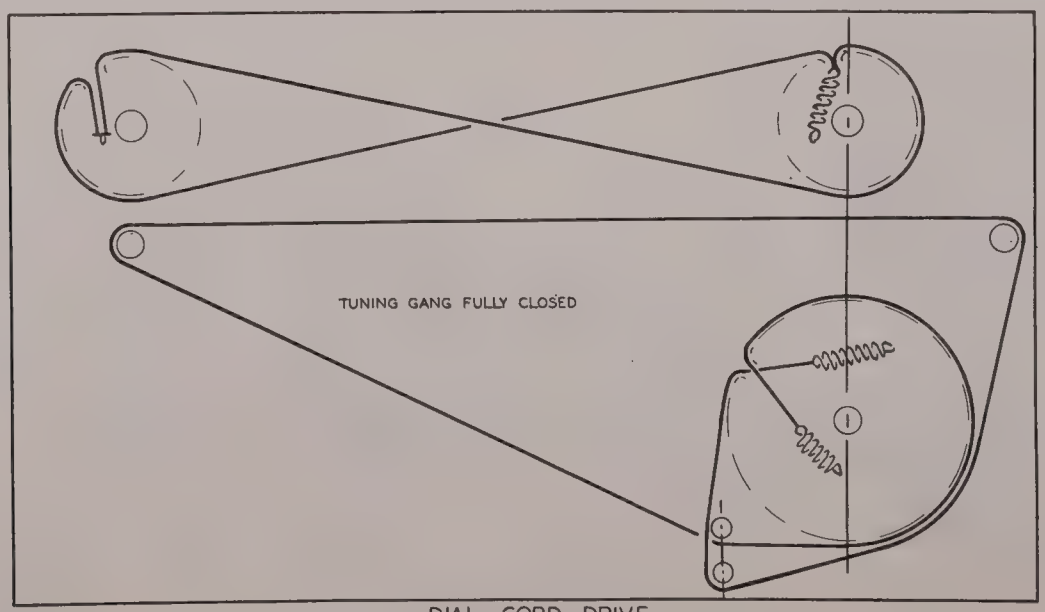
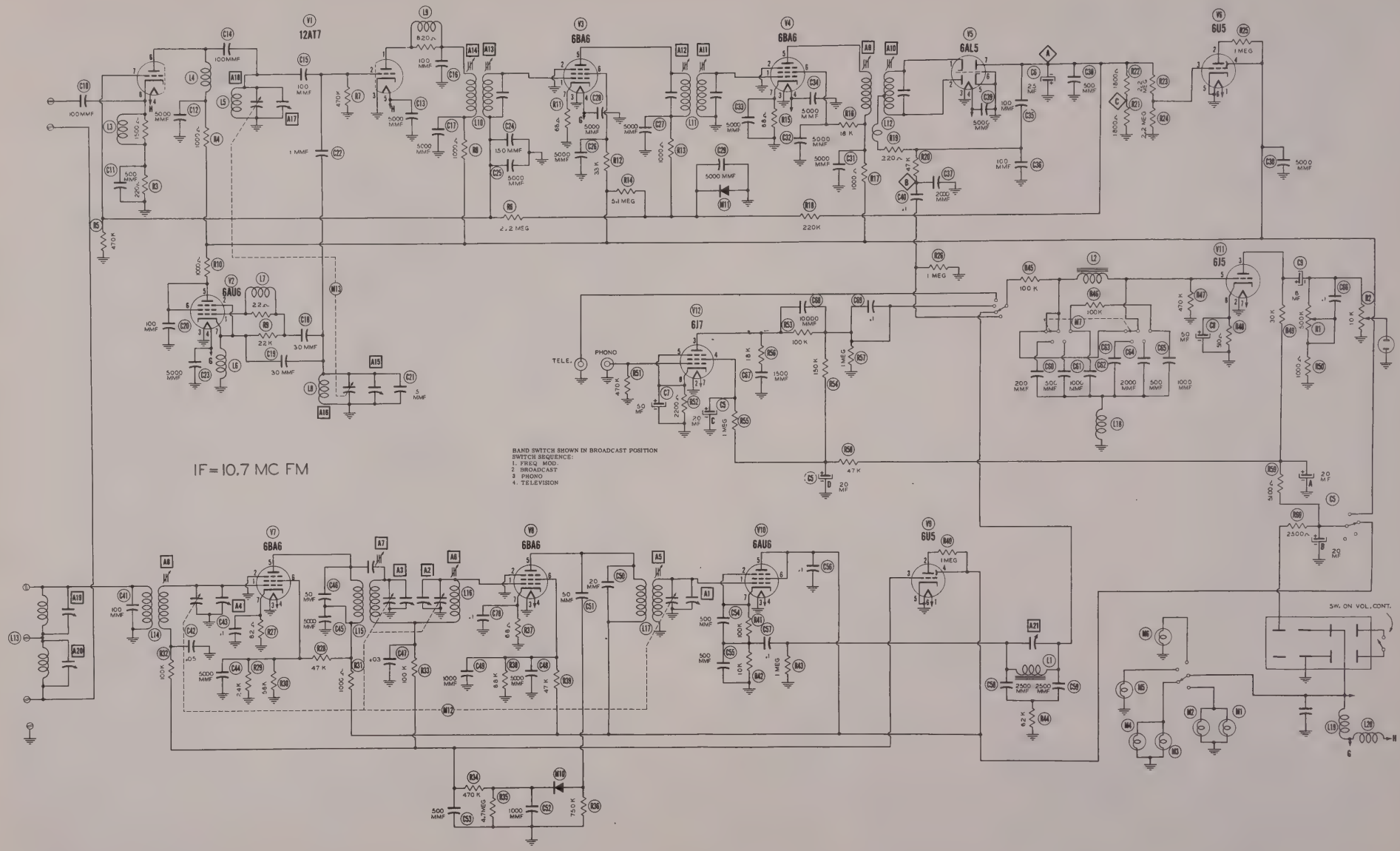


DIAL CORD DRIVE



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

On some models of this tuner, the FM IF adjustments have been sealed at the factory. On these sets there is a small "G" stamped on the FM sub-chassis.

If FM alignment is required, the cement must be softened by applying carbon-tetrachloride or speaker cement solvent. Do NOT apply pressure to the slugs before the glue has been softened.

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to ant. terminal #1. Low side to chassis.	1600KC (400 ~ Mod.)	AM	1600KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	200MMF	"	600KC	"	600KC	"	A5, A6, A7, A8	Adjust for maximum output. Repeat steps 1 and 2 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V4). Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC Probe to Point (A) Common to chassis.	A9	Adjust for maximum deflection.
4.	.01MFD	"	"	"	"	DC Probe to Point (B) Common to Point (C)	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
5.	Direct	High side to ungrounded tube shield floating over mixer tube (V1). Low side to chassis.	"	"	"	DC Probe to Point (A) Common to chassis.	A11, A12, A13, A14	Adjust for maximum deflection.

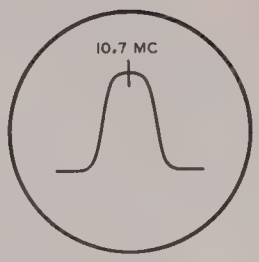


FIG. 1

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
3.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V3). Low side to chassis.	10.7MC (450KC Sweep)	FM	Point of non-interference	Vert. Amp. to Point (A) Low side to chassis.	A9, A11, A12	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as per Fig 1.
4.	Direct	High side to ungrounded tube shield floating over mixer tube (V1). Low side to chassis.	"	"	"	"	A13, A14	"
5.	Direct	"	"	"	"	Vert. Amp. to Point (B) Low side to chassis.	A10, A9	Reconnect capacitor C6. Adjust A10 so 10.7MC occurs at center of crossover lines as per Fig 2. Slightly retouch A9 for maximum amplitude and straightness of crossover lines.

FIG. 2

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	300Ω carbon res.	High side thru 300Ω to FM ant. terminal. Low side to chassis.	106MC (Unmod.)	FM	106MC	DC Probe to Point (A) Common to chassis.	A15	Adjust for maximum deflection.
7.	"	"	90MC	"	90MC	"	A16	Expand or compress coil turns for maximum deflection. Repeat steps 6 and 7 until no further improvement can be made.
8.	"	"	106MC	"	106MC	"	A17	Adjust for maximum deflection.
9.	"	"	90MC	"	90MC	"	A18	Rock tuning gang while adjusting coil turns for maximum deflection. Repeat steps 8 and 9 until no further improvement can be made.

AM WAVE TRAP ADJUSTMENT

When the receiver is operated near a powerful station, interference known as "crosstalk" may occur. This is apparent when the modulation from one station appears in the background when the receiver is tuned to another station. This type of interference should not be confused with interference from two stations on the same channel. (Such interference occurs usually at night and cannot be eliminated).

Determine the station that is causing the interference and note its frequency on the dial.

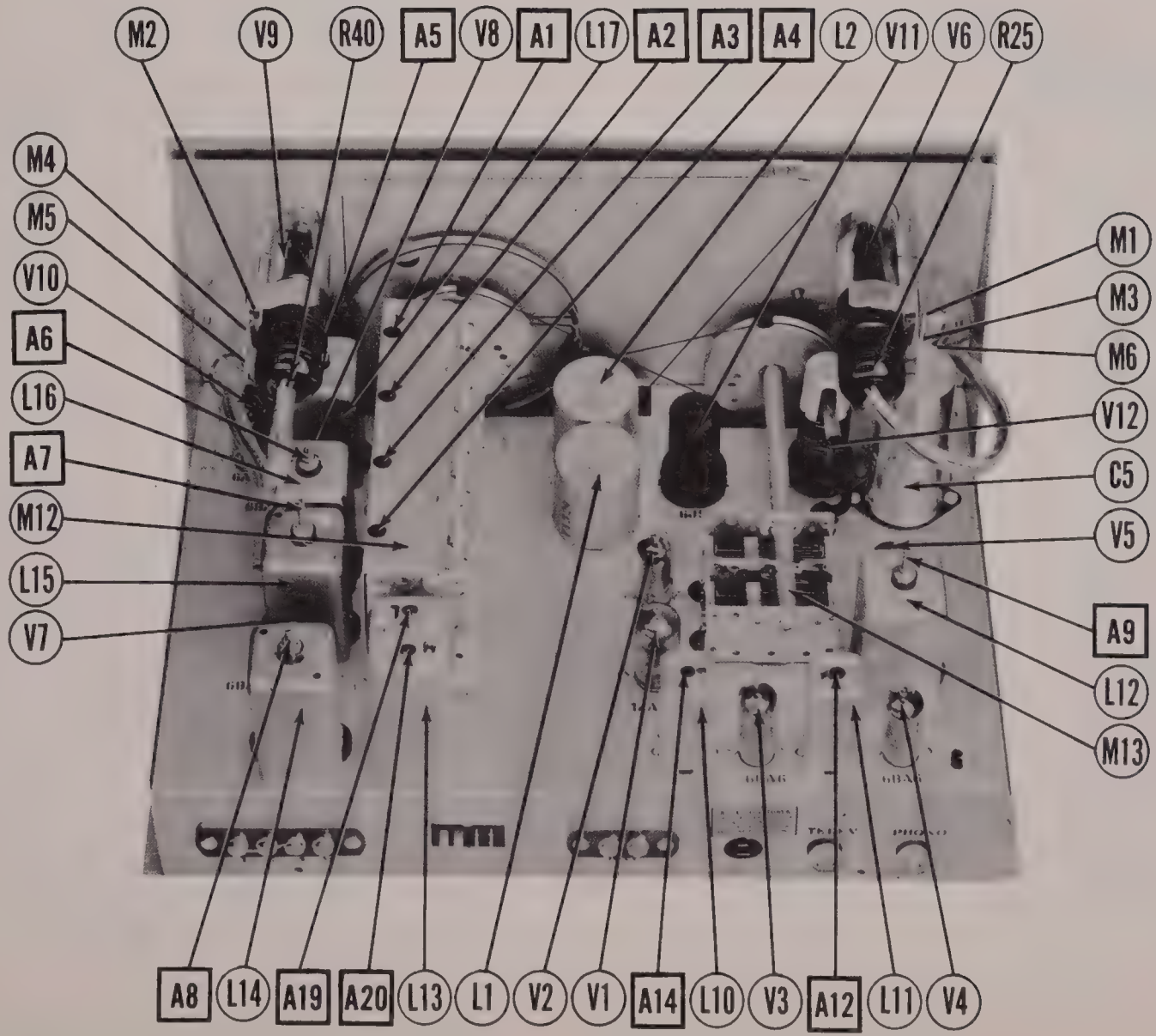
If the interfering station has its operating frequency between 550 and 1000KC, remove the short between terminals "1" and "2" on the terminals strip on the rear of the tuner chassis and tune in the interfering station. Adjust A19 until the signal from the interfering station is reduced to a minimum, as indicated by maximum opening of the tuning indicator "eye". If the interfering station lies between 900 and 1800KC, remove the short between terminals "2" and "3" and repeat the above procedure using A20.

If two stations are causing crosstalk interference, one between 550 and 1000KC, the other between 900 and 1800KC, they may be eliminated by using both traps. In this case remove the short between all three terminals on the terminal strip and adjust each trap to eliminate the station within its range. If two stations within the range of only one trap are causing interference, it is only possible to eliminate one of them. Choose the one causing the most interference.

10KC FILTER ADJUSTMENT

The 10KC filter located in the AM detector output circuit is for the purpose of eliminating a 10KC beat note which may occur from station operating on the channel adjacent to the one the receiver is tuned to receive.

Connect a 10KC audio generator between the junction R41 and R42 and chassis. Adjust A21 for MINIMUM indication on an output meter connected across the speaker voice coil.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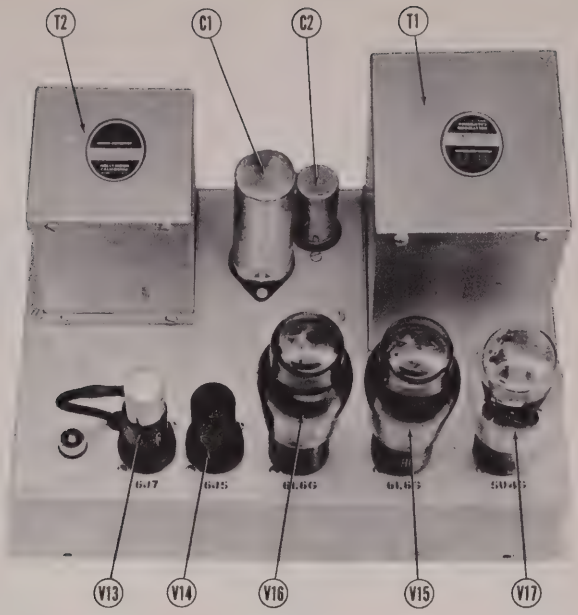
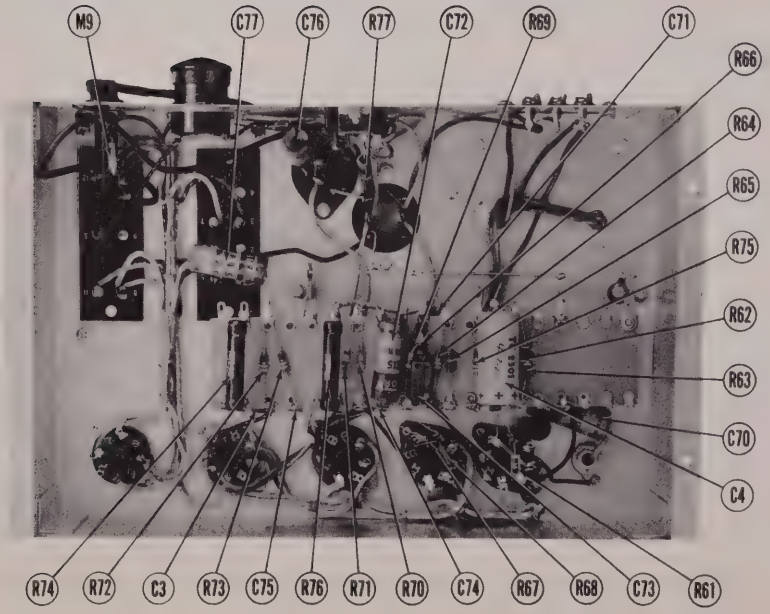
V9
R40
A5
V8
A1
L17
A2
A3
A4
L2
V11
V6
R25
M4
M5
V10
A6
L16
A7
M12
L15
V7
M1
M3
M6
V12
C5
V5
A9
L12
M13
A8
L14
A19
A20
L13
L1
V2
V1
A14
L10
V3
A12
L11
V4


T2
C1
C2
T1
V13
V14
V16
V15
V17


M9
C77
C76
R77
C72
R69
C71
R66
R64
R65
R75
R62
R63
C70
C4
R74
R72
C3
R73
C75
R76
R71
R70
C74
R67
R68
C73
R61

ARVIN MODEL
341T (Ch. RE-274)

ARVIN MODEL
341T (Ch. RE-274)

TRADE NAME	Arvin Model 341T (Chassis RE-274)
MANUFACTURER	Noblitt Sparks Industries, Columbus, Indiana
TYPE SET	AC-DC Operated Superheterodyne Receiver
TUBES (FOUR)	Types 12SA7 Converter, 12SQ7 DET-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	105-125 Volts AC-DC — RATING: .250 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available, if not connect a .1MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to stator of rear section of tuning gang. Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	50MMF	Remove hank ant. and connect high side to ant. lug on ant. coil.	1400KC	1400KC	"	A3	Replace set in cabinet and turn dial to 1400KC. Remove chassis from cabinet without disturbing gang setting. Mark 1400KC on front of gang and rock tuning gang while adjusting A3 for maximum.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12SA7GT	12SA7GT	8AD	
V2	DET.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
V3	Power Output	50L6GT	50L6GT	7AC	
V4	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	A19176	PRSA86D4A	EDL4215C		TA-305	Filter Red
B	20	150						Filter Blue
C	20	25						Output Cath. Bypass Green
C2	14	500		1468-000025	5W5Q2	GP1K-15	MS-415	RF Coupling
C3	.05	200	C20067-503	P288-05	PTE4S5		TM-15	AVC Filter
C4	50		A21643	1468-00005	5W5Q5	GP1K-50	1FM-45	Osc. Grid Cap.
C5	100		A21645	1468-0001	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C6	.002	600	C20068-202	P688-002	PTE6D2	GP2M-002	TM-22	Audio Coupling
C7	100		A21645	1468-001	5W5T1	GP1K-100	1FM-31	AF Amp. Plate Bypass
C8	.002		*	P688-002	PTE6D2	GP2M-002	TM-22	Audio Coupling
C9	10000		C20203-103	P688-01	PTE6S1	821-01	TM-11	Output Plate Bypass
C10	.05	400	C20068-503	P488-05	PTE4S5		TM-15	Line Isolation
C11	.05	400	C20068-503	P488-05	PTE4S5		TM-15	Line Filter

* Items C8 and R6 are combined into one unit, obtainable under MFGR'S Part no. A21642.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	2 Meg.	½	B18587	Q13-139	M-66-Z	Volume control
B	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions

RESISTORS

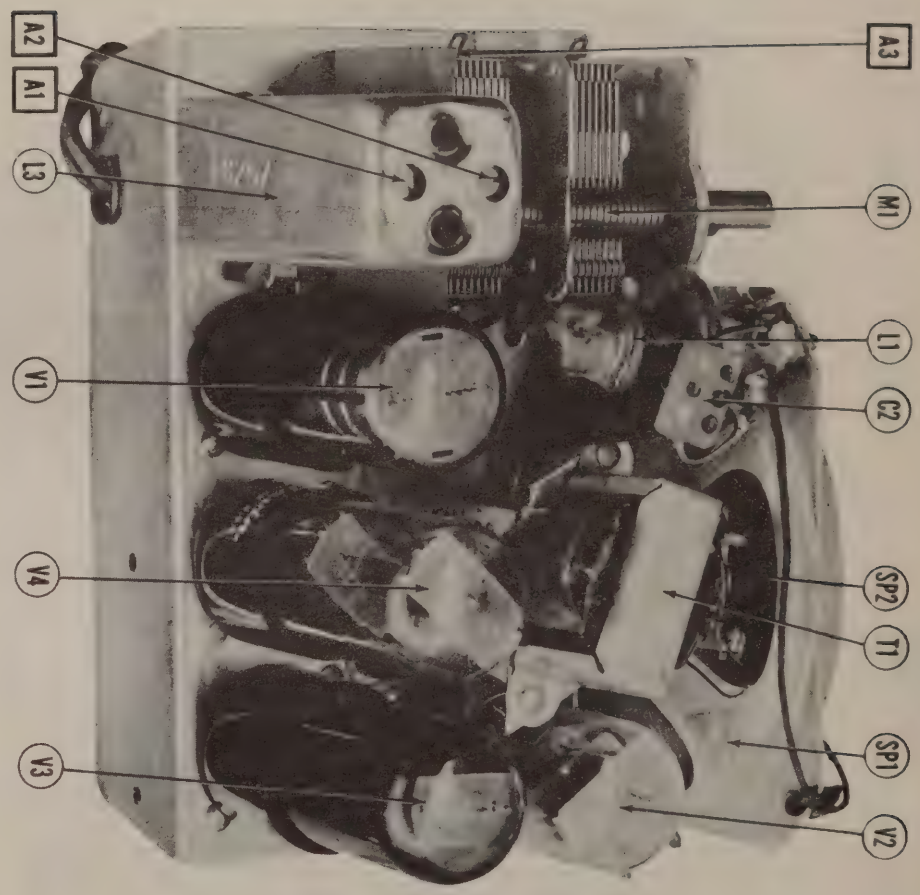
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARVIN PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	C20060-223	BTS-22K	Osc. Grid
R3	4.7 Meg.	½	C20060-475	BTS-4.7 Meg.	AVC Network
R4	15 Meg.	½	C20060-156	BTS-15 Meg.	AF Grid
R5	470KΩ	½	C20060-474	BTS-470K	AF Plate
R6	1 Meg.	½	C20060-105	BTS-1 Meg.	Output Grid See Note
R7	150Ω	½	C20060-151	BW-½-150	Output Cathode
R8	2200Ω	1	C20070-222	BW-1-2200	Filter
R9	15Ω	½	C20060-150		Surge Limiter
R10	47Ω	1	A19177	BW-1-47	Filament Dropping, Wire Wound
R11	330KΩ	½	C20060-334	BTS-330K	Isolation

Note. Items C8 and R6 are combined into one unit, obtainable under MFGR'S part no. A21642.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	1800Ω	3.3Ω	162Ω	.4Ω	AC18258-1	A-3332	A-3025	RO-2	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA ARVIN PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113 ¶		
SP1	PM	3.3Ω	C-21626	MOD. P4-X	4A07 ¶	¶ Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"				

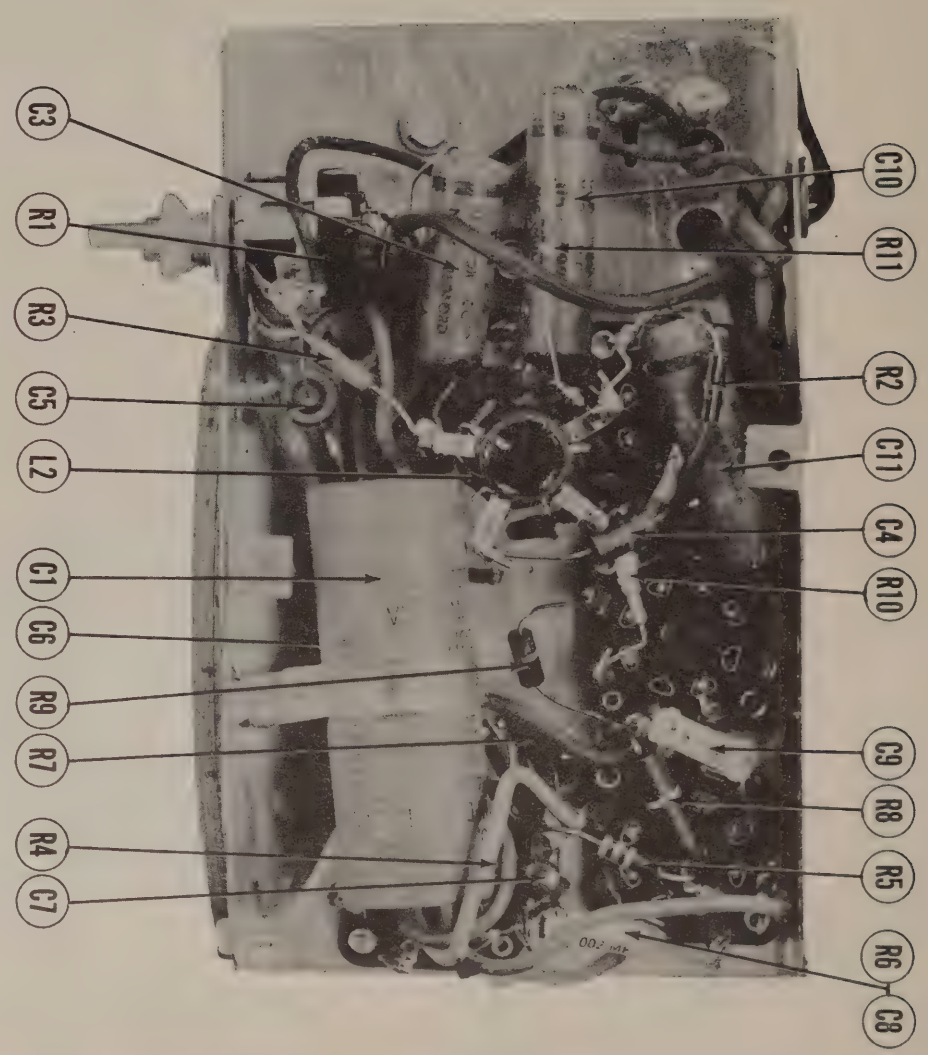
R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ARVIN PART No.	REPLACEMENT DATA MEISSNER PART No.
L1	Ant. Trans.	34Ω	3Ω	AC18255-1	
L2	Osc. Coil	.7Ω	5.5Ω	AC18256-1	14-1060
L3	IF Trans.	16Ω	15Ω	AC18257-1	16-6659

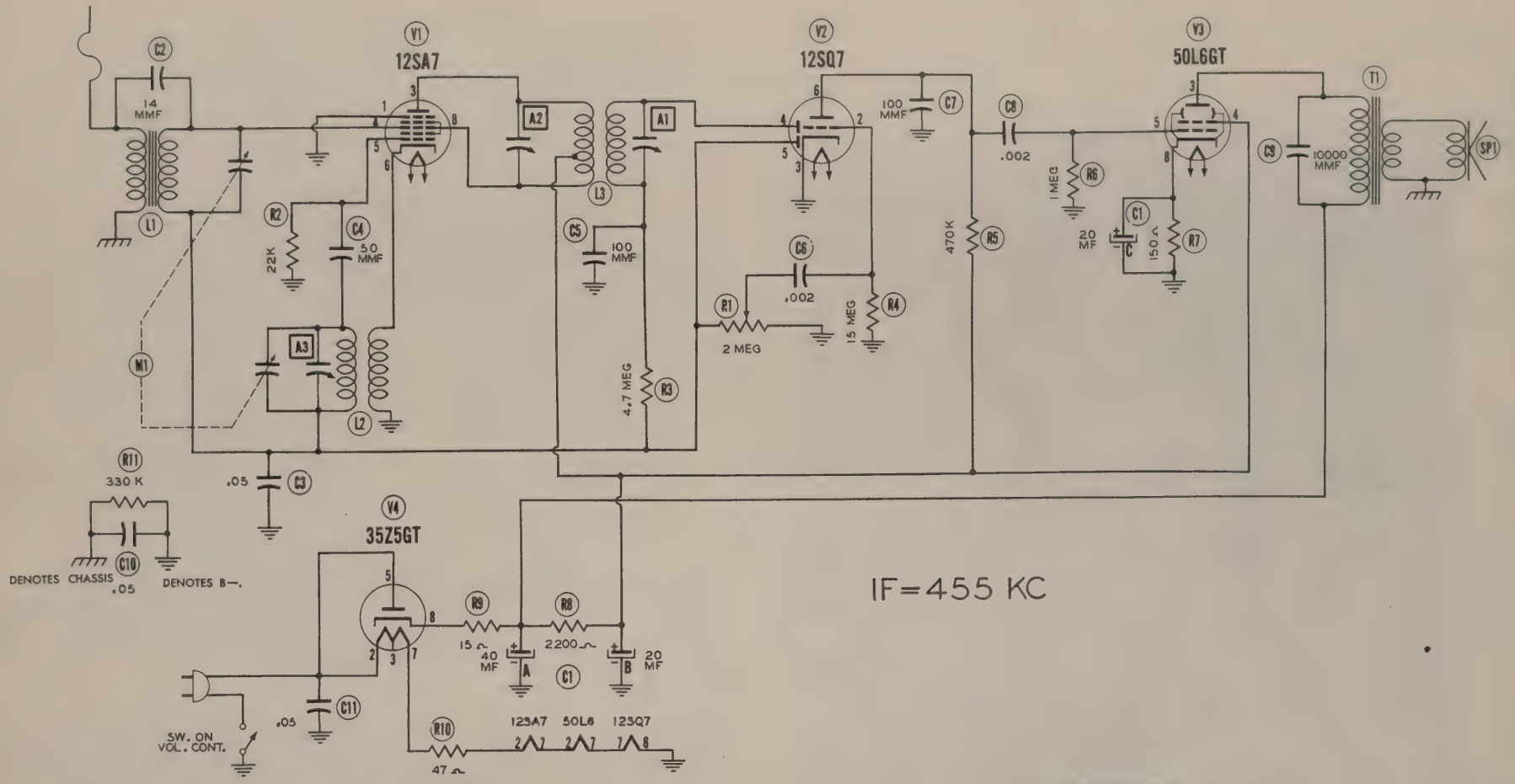
MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	2 Gang Var. Cap.	C22047	(14-377MMF, 31-195MMF)
	Cabinet	D16511-4	
	Knob	C22028-6	Tuning
	Knob	A18262-8	Volume

CHASSIS—BOTTOM VIEW



ARVIN MODEL 341T



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7GT	0V	77VAC	100VDC	100VAC	6-6.8VDC	0V	65VAC	-1VDC
V 2	12SQ7GT	0V	-.8VDC	0V	-.6VDC	-2.2VDC	55VDC	12VAC	0V
V 3	50L6GT	0V	65VAC	125VDC	100VDC	.1VDC	0V	12VAC	5.9VDC
V 4	35Z5GT	0V	117VAC	110VAC	0V	117VAC	130VDC	85VAC	130VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7GT	330KΩ	70Ω	†2.2KΩ	†2.2KΩ	22KΩ	.7Ω	60Ω	6.7 Meg.
V 2	12SQ7GT	330KΩ	15 Meg.	0Ω	2 Meg.	6.7 Meg.	†470KΩ	12Ω	0Ω
V 3	50L6GT	Inf.	60Ω	†170Ω	†2.2KΩ	1 Meg.	Inf.	12Ω	150Ω
V 4	35Z5GT	Inf.	150Ω	140Ω	Inf.	150Ω	40KΩ	120Ω	40KΩ

† MEASURED FROM PIN 8 OF V4

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A PHOTOFACT STANDARD NOTATION SCHEMATIC

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84-3

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

BENDIX MODELS
2001, 2002, 2020, 2021, 3001, 3002, 3030, 3031

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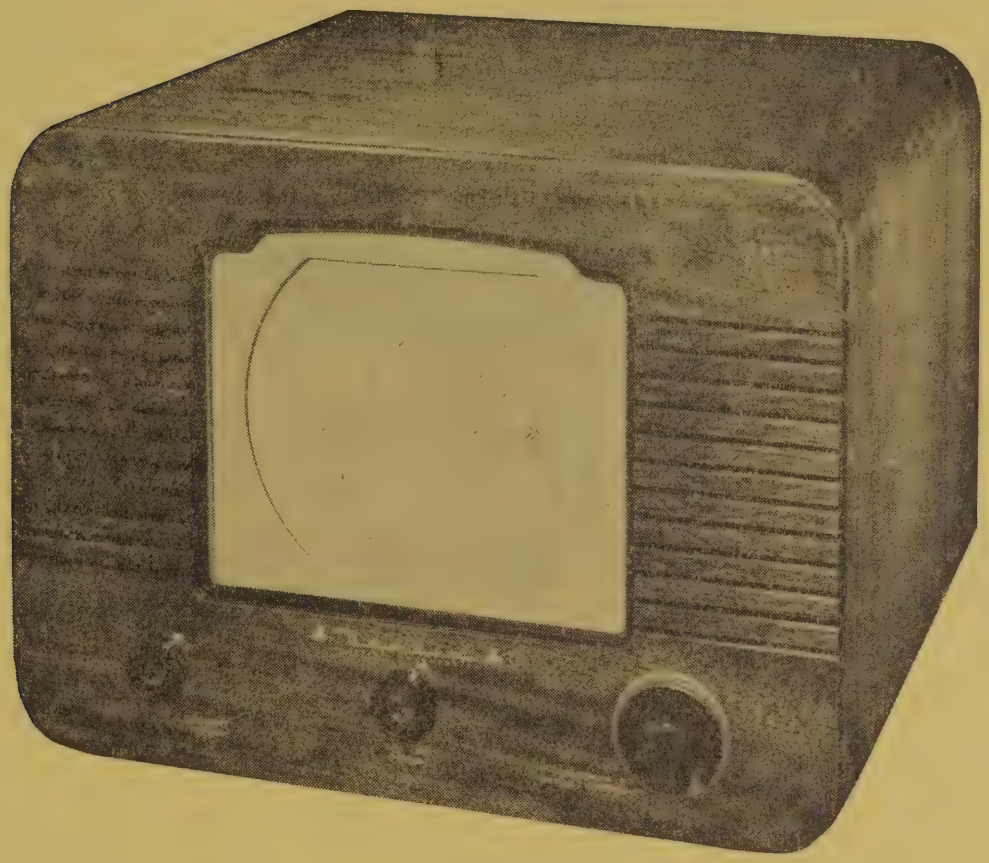
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 2001

BENDIX MODELS
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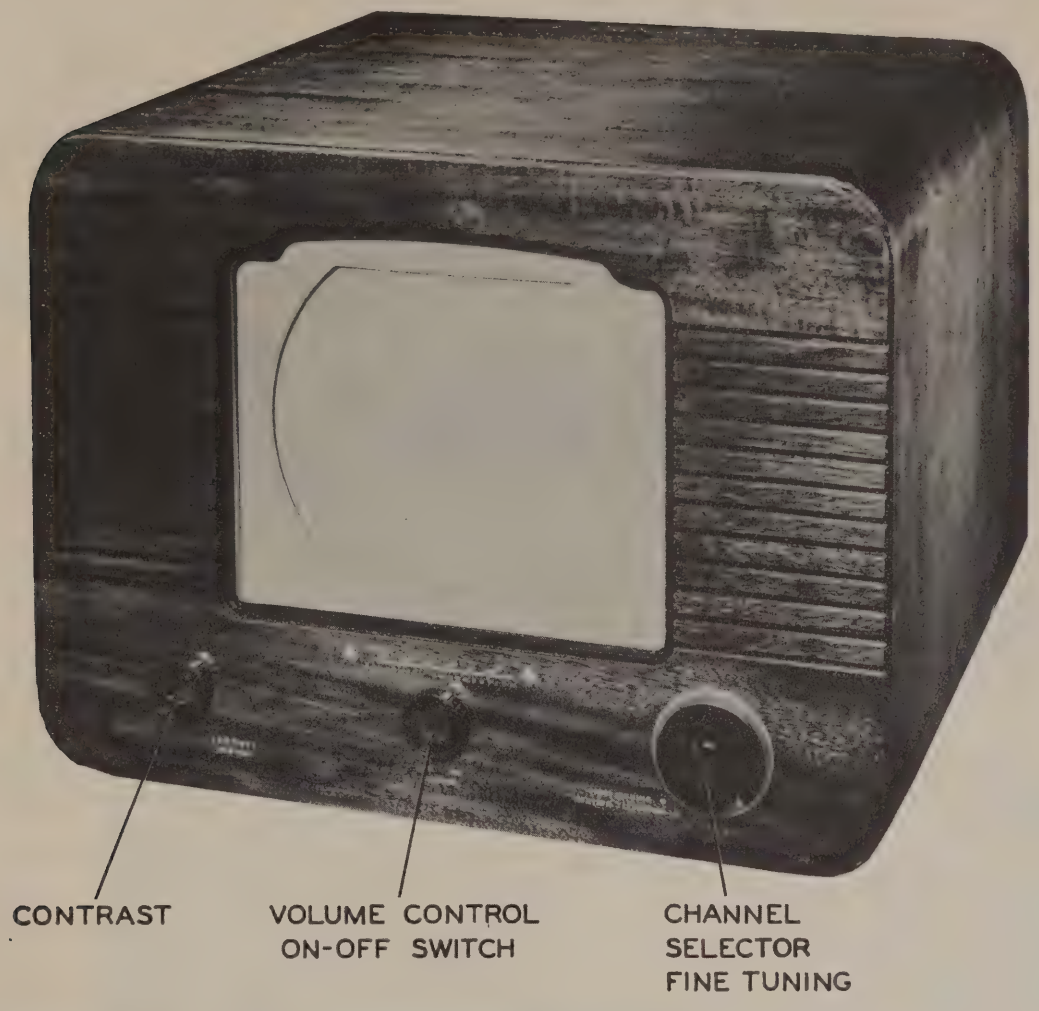
BENDIX MODELS 2001, 2002, 2020, 2021, 3001 3002, 3030, 3031



BENDIX MODEL 2001

TRADE NAME	Bendix, Models 2001, 2002, 2020, 2021, 3001, 3002, 3030, 3031
MANUFACTURER	Bendix Aviation Corp., Radio Div., Baltimore 4, Maryland
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.5 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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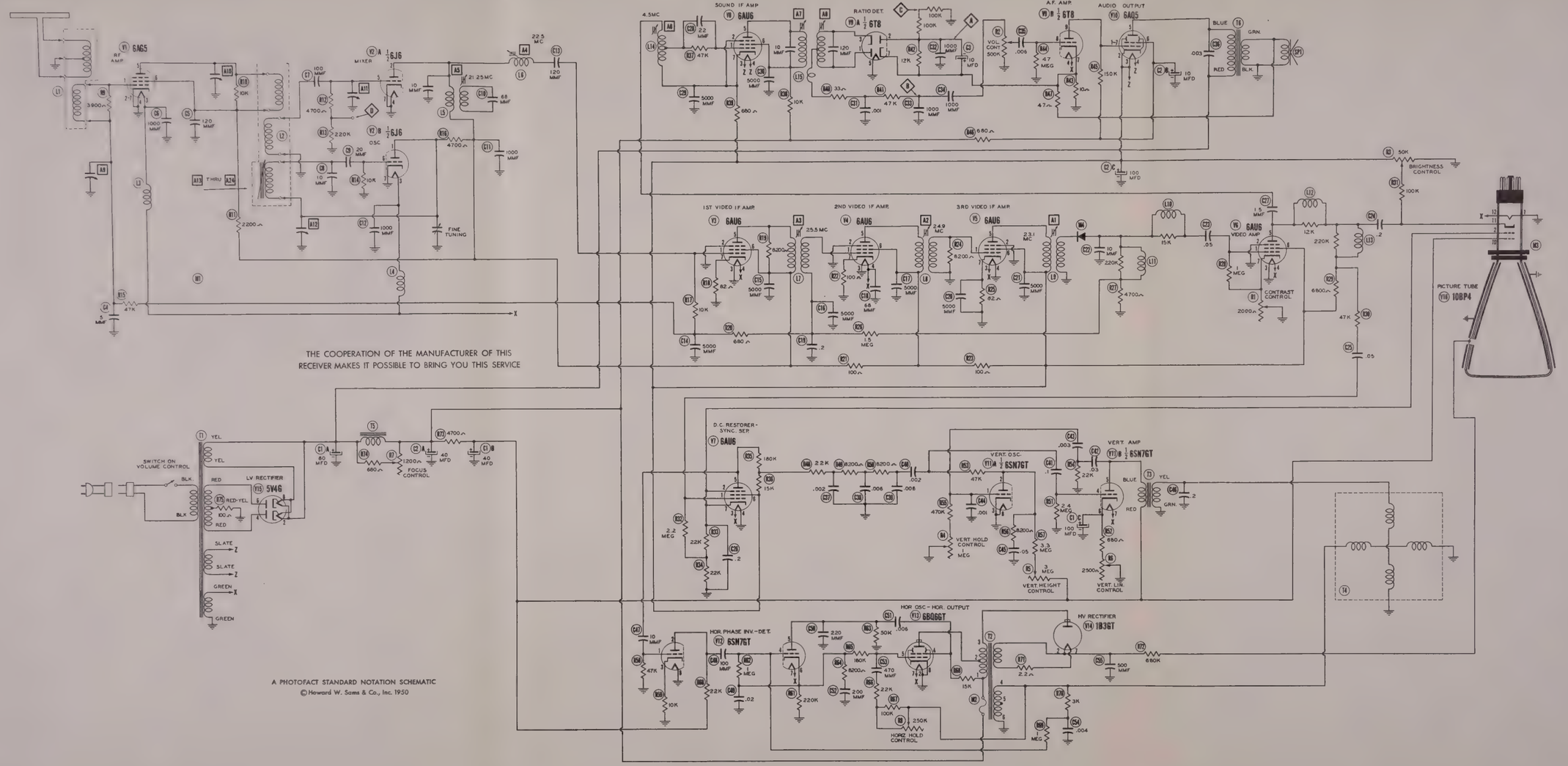
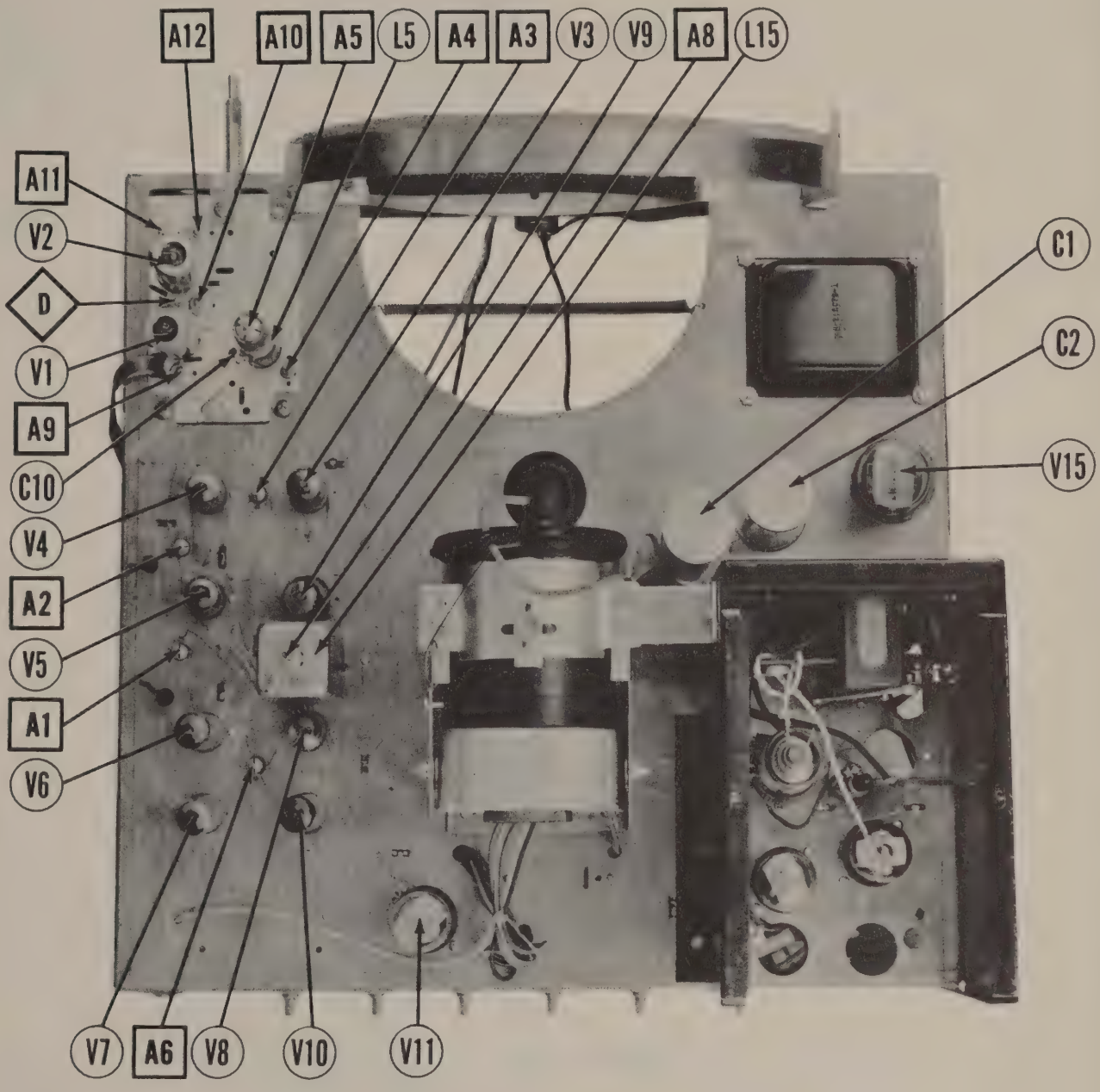
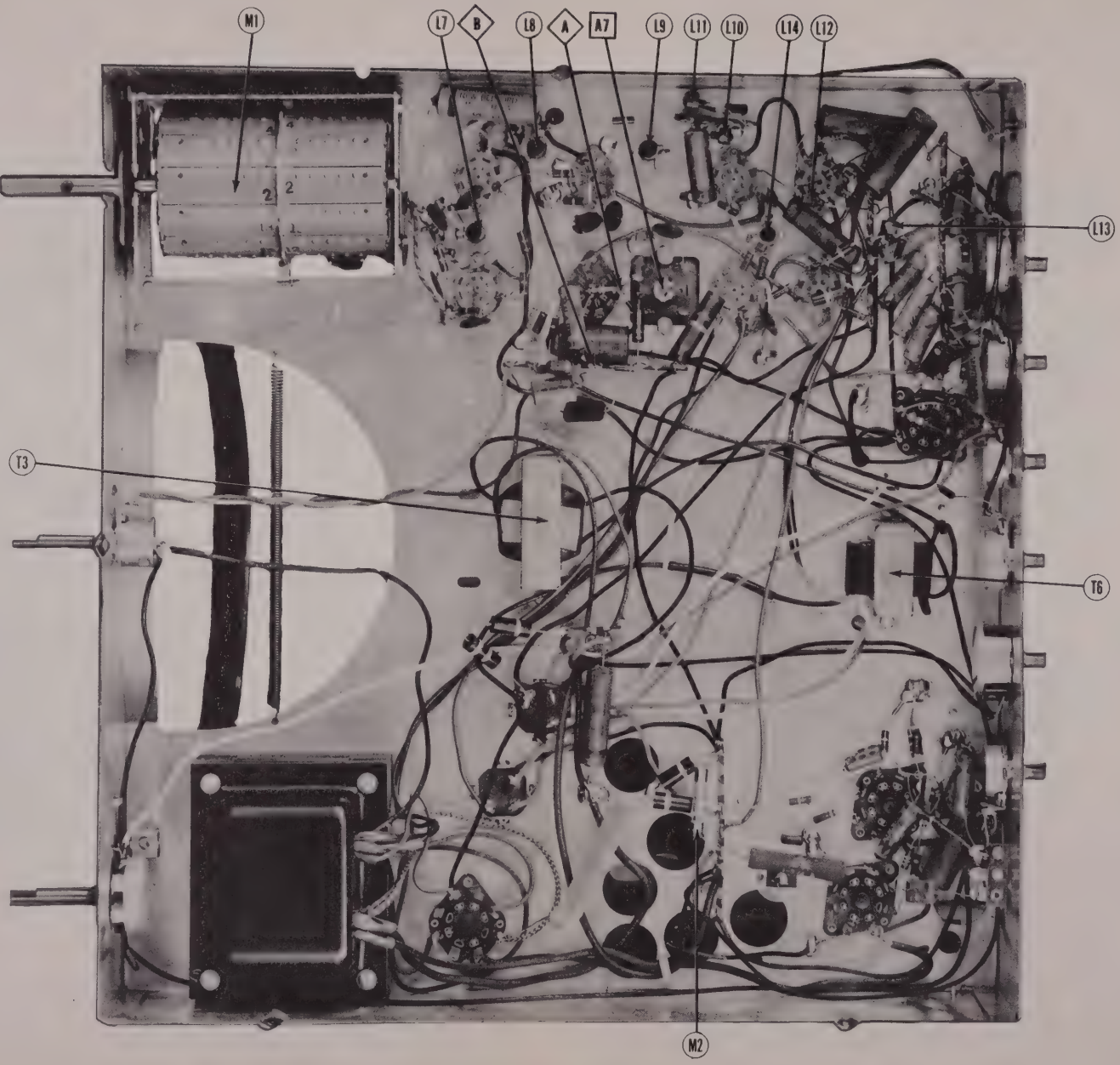


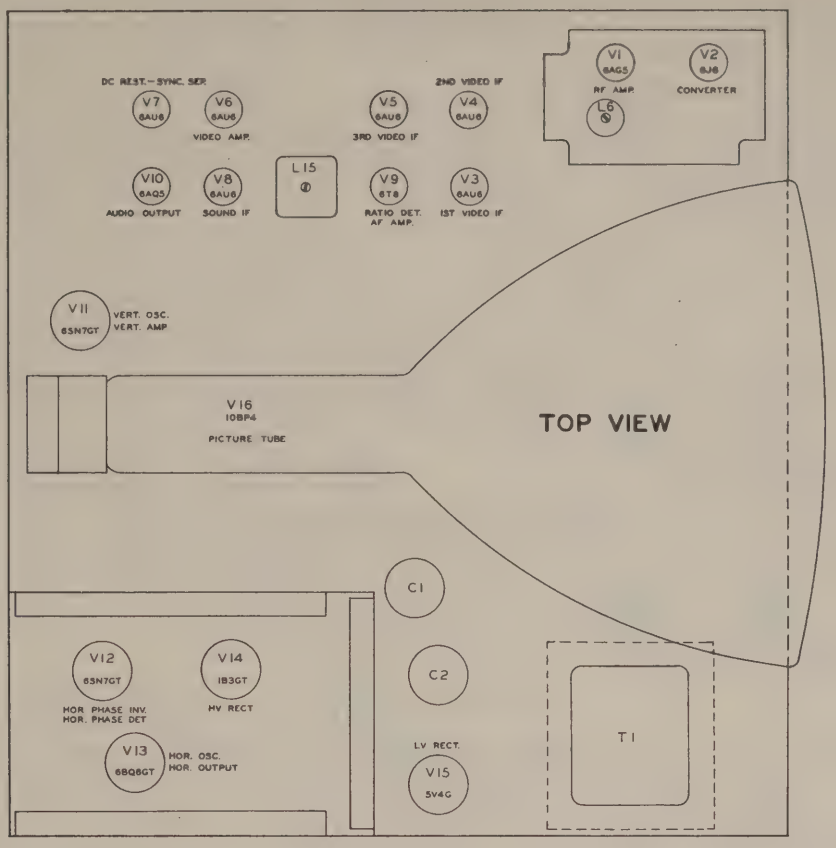
BENDIX MODELS 2001, 2002,
2020, 2021, 3001 3002, 3030, 3031

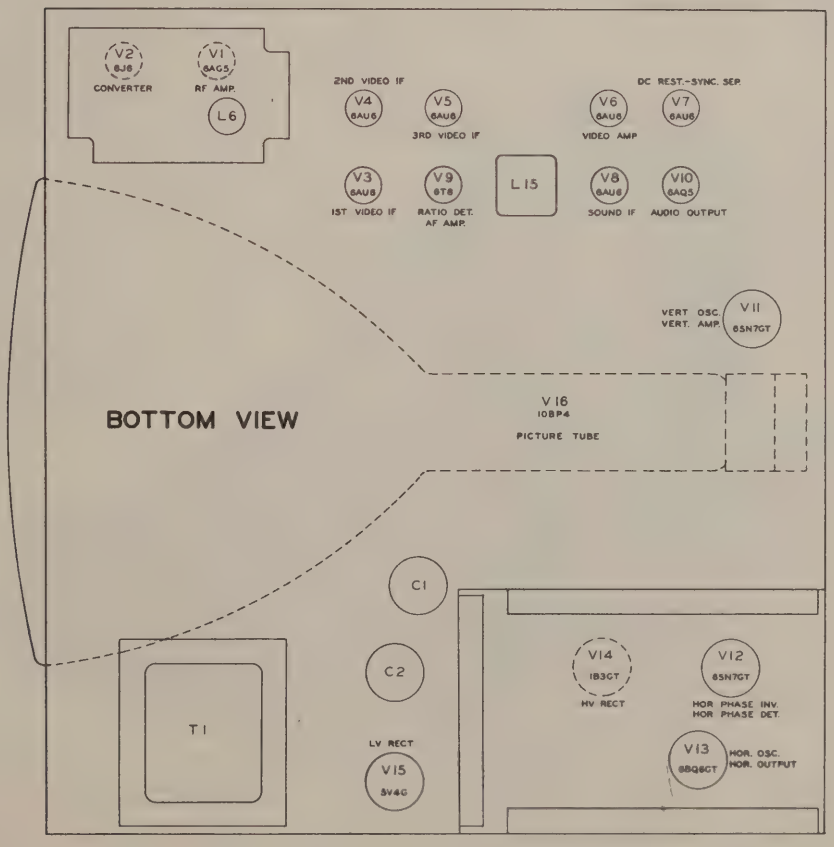


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

BENDIX MODELS 2001, 2002, 2020, 2021, 3001, 3002, 3030, 3031

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The shock hazard from the high voltage power supply may be eliminated by removing the horizontal oscillator tube (V13). Connect the negative lead of a 1.5 volt battery to the AGC test point, connect the positive lead to chassis.

VIDEO IF ALIGNMENT

Remove the channel 13 segment of the converter section of the tuner turret and turn the channel selector to channel 13. This will prevent erroneous indications from the local oscillator.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	23.1MC (Unmod.)	13	DC Probe thru 47KΩ to "Video test point". Common to chassis.	A1	Adjust for maximum deflection.
2.	Direct	"	24.9MC	"	"	A2	"
3.	Direct	"	25.5MC	"	"	A3	"
4.	Direct	"	22.5MC	"	"	A4	"
5.	Direct	"	21.25MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	24MC (10MC Sweep)	21.25MC 25.75MC	13	Vert. Amp. thru 47KΩ to "Video test point". Low side to chassis.		Check for response curve similar to Fig 1. If necessary, slightly retouch A1 thru A5 for optimum results.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from point A to B-. The junction of these two resistors is alignment point C as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V6). Low side to chassis.	4.5MC (Unmod.)	13	DC Probe to Point (A) Common to chassis.	A6, A7	Adjust for maximum deflection.
8.	.01MFD	"	"	"	DC Probe to Point (B) Common to Point (C)	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V6). Low side to chassis.	4.5MC (1MC Sweep)	4.5MC	13	Vert. Amp. to Point (A) Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C3. Adjust for maximum amplitude and symmetry as per Fig 2.
8.	.01MFD	"	"	"	"	Vert. Amp. to Point (B). Low side to chassis.	A8	Adjust A8 so 4.5MC occurs at center of crossover lines as per Fig 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

Replace the channel 13 segment of the tuner turret.
The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC Sweep)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (D) Low side to chassis.	A9, A10, A11	Adjust for response curve similar to Fig 4 with markers as shown.
10.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check for response curve similar to Fig 4 If optimum response is desired on any particular channel, make slight adjustment of A9, A10 and A11 with channel selector set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC1 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

FIG. 1

FIG. 2

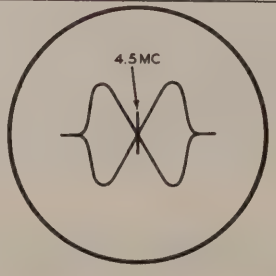


FIG. 3

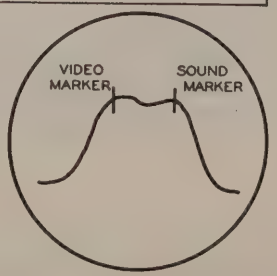


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount, for a majority of the channels, it may be possible to correct them in one step using A12. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A12 will not bring all channels within the range of the fine tuning control, it will be necessary to use the individual channel oscillator adjustments for each channel that is off frequency, (step 11). The individual channel oscillator adjustment screws are reached through a hold just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.

Set the fine tuning control to the mid-position of its range.

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC Sweep)	211.25MC 215.75MC	13	Vert. Amp. to "Video test point". Low side to chassis.	A13	Adjust to place the sound marker in the notch as per Fig 5. The video marker should fall above 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A14	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A15	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A16	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A17	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A18	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A19	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A20	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A21	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A22	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A23	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A24	

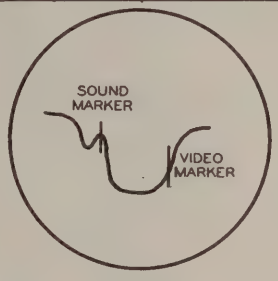
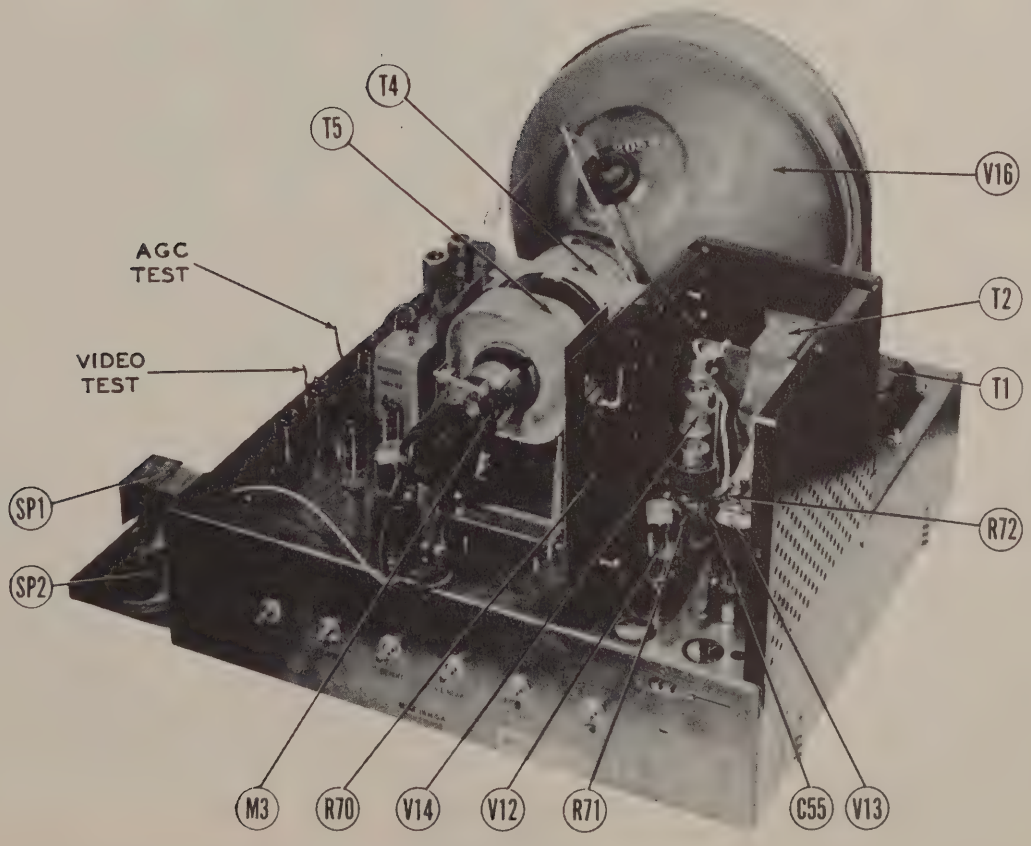


FIG. 5



CHASSIS-TOP VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.5VDC	0V	6.3VAC	0V	105VDC	105VDC	0V		
V 2	6J6	87VDC	130VDC	6.3VAC	0V	-1.7VDC	$-5VDC	0V		
V 3	6AU6	-2.1VDC	0V	0V	6.3VAC	130VDC	130VDC	.8VDC		
V 4	6AU6	-.4VDC	0V	0V	6.3VAC	135VDC	135VDC	.9VDC		
V 5	6AU6	0V	0V	6.3VAC	0V.	135VDC	135VDC	1.1VDC		
V 6	6AU6	.4VDC	0V	0V	6.3VAC	100VDC	135VDC	19VDC		
V 7	6AU6	.2VDC	9.8VDC	6.3VAC	0V	105VDC	135VDC	9.8VDC		
V 8	6AU6	#6.1VDC	#8.8VDC	#0V	#6.3VAC	#110VDC	#110VDC	#8.8VDC		
V 9	6T8	-.2VDC	-.6VDC	-.4VDC	6.3VAC	0V	0V	0V	-.4VDC	125VDC
V 10	6AQ5	#-7.4VDC	#0V	#0V	#6.3VAC	#230VDC	#225VDC	#-7.4VDC		
V 11	6SN7GT	-30VDC -55VDC	45VDC 80VDC	0V	0V	340VDC	7VDC 18VDC	6.3VAC	0V	
V 12	6SN7GT	0V	310VDC	15VDC	1.2VDC	-18VDC	10VDC	6.3VAC	0V	
V 13	6BQ6GT	0V	0V	0V	105VDC	-23VDC	10VDC	6.3VAC	0V	TOP CAP *
V 14	1B3GT	* DO NOT MEASURE								
V 15	5V4G	0V	410VDC	-22VDC	390VAC	0V	390VAC	0V	410VDC	
V 16	10BP4	0V	10VDC	PIN 10 325VDC	.2VDC	PIN 11 135VDC	PIN 12 6.3VAC			

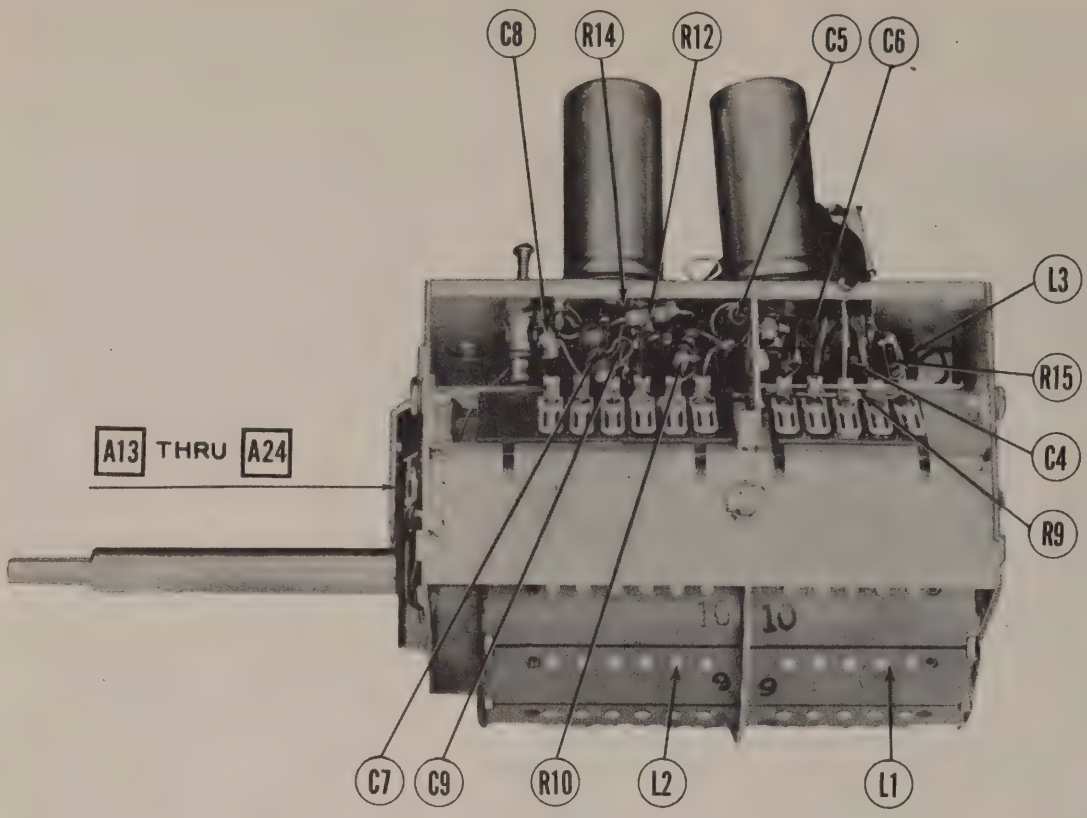
$ TAKEN WITH VACUUM TUBE VOLTMETER.
# MEASURED FROM PIN 2 OF V10.
* DO NOT MEASURE.

RESISTANCE READINGS

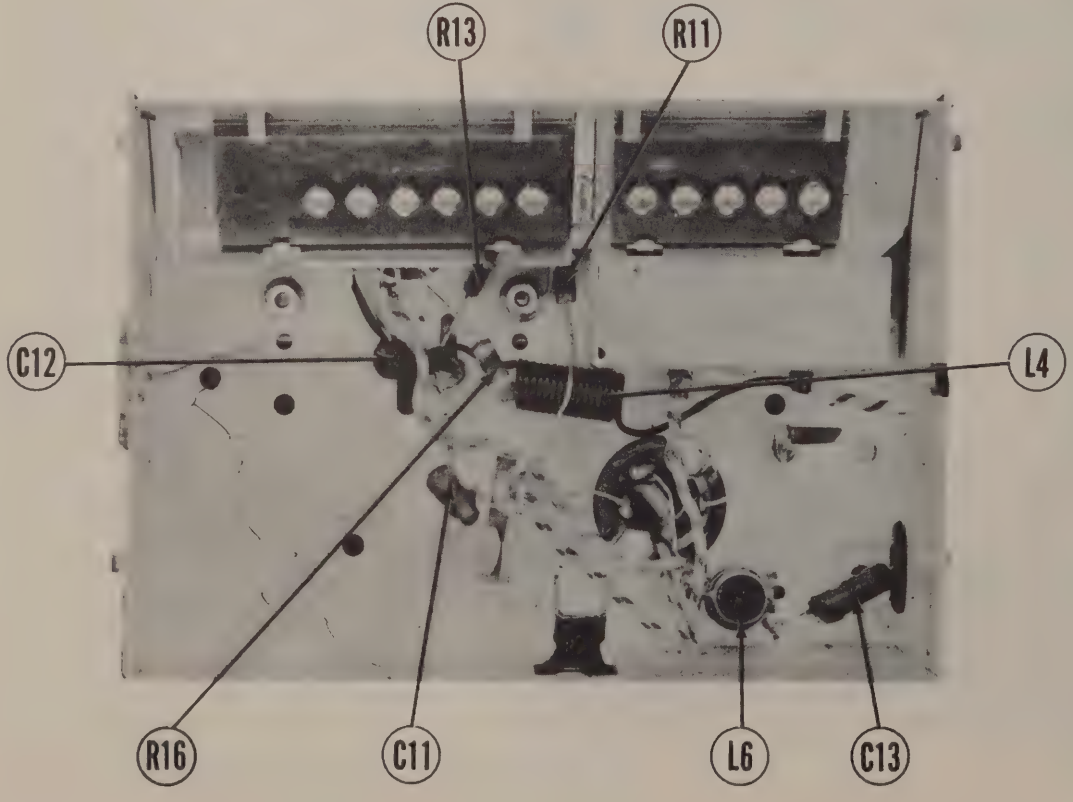
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1.5 Meg.	0Ω	.1Ω	0Ω	#2.4KΩ	#2.4KΩ	0Ω		
V 2	6J6	#5KΩ	#200Ω	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AU6	1.5Meg.	0Ω	0Ω	.1Ω	#200Ω	#200Ω	82Ω		
V 4	6AU6	1.5Meg.	0Ω	0Ω	.1Ω	#100Ω	#100Ω	100Ω		
V 5	6AU6	.1Ω	0Ω	.1Ω	0Ω	#0Ω	#0Ω	82Ω		
V 6	6AU6	1 Meg.	0Ω	0Ω	.1Ω	#6.8KΩ	#0Ω	1Ω		
V 7	6AU6	2.2 Meg.	44KΩ	.1Ω	0Ω	#200KΩ	#0Ω	44KΩ		
V 8	6AU6	#47KΩ	#680Ω	#0Ω	#.1Ω	†10KΩ	†10KΩ	#680Ω		
V 9	6T8	Inf.	12KΩ	Inf.	.1Ω	0Ω	Inf.	10Ω	4.7 Meg.	†150KΩ
V 10	6AQ5	†150KΩ	#0Ω	#0Ω	#.1Ω	†450Ω	†1000Ω	†150KΩ		
V 11	6SN7GT	1.4 Meg. 470KΩ	†6.3Meg. †3.3Meg.	0Ω	2.2 Meg.	†5.5KΩ	3KΩ 700Ω	.1Ω	0Ω	
V 12	6SN7GT	47KΩ	†25KΩ	10KΩ	600KΩ	47KΩ	220KΩ	.1Ω	0Ω	
V 13	6BQ6GT	Inf.	0Ω	Inf.	†15KΩ	380KΩ	220KΩ	.1Ω	0Ω	Top Cap †320Ω
V 14	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Top Cap 500Ω
V 15	5V4G	Inf.	190KΩ	100Ω	141Ω	Inf.	139Ω	Inf.	190KΩ	
V 16	10BP4	0Ω	44KΩ	PIN 10 †5KΩ	PIN 11 135KΩ	100KΩ	PIN 12 .1Ω			

† MEASURED FROM PIN 8 OF V15.
# MEASURED FROM PIN 2 OF V10.

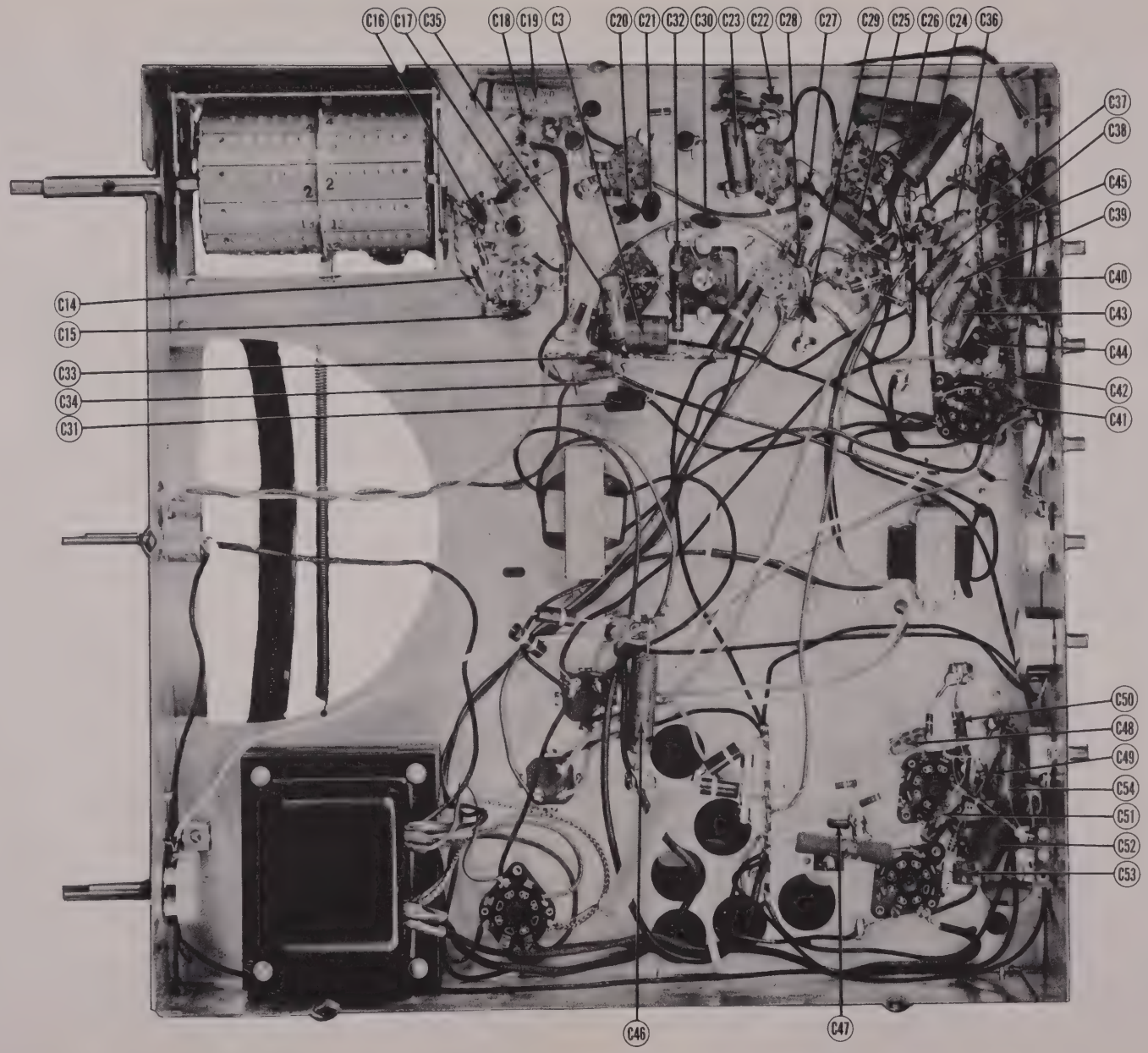
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



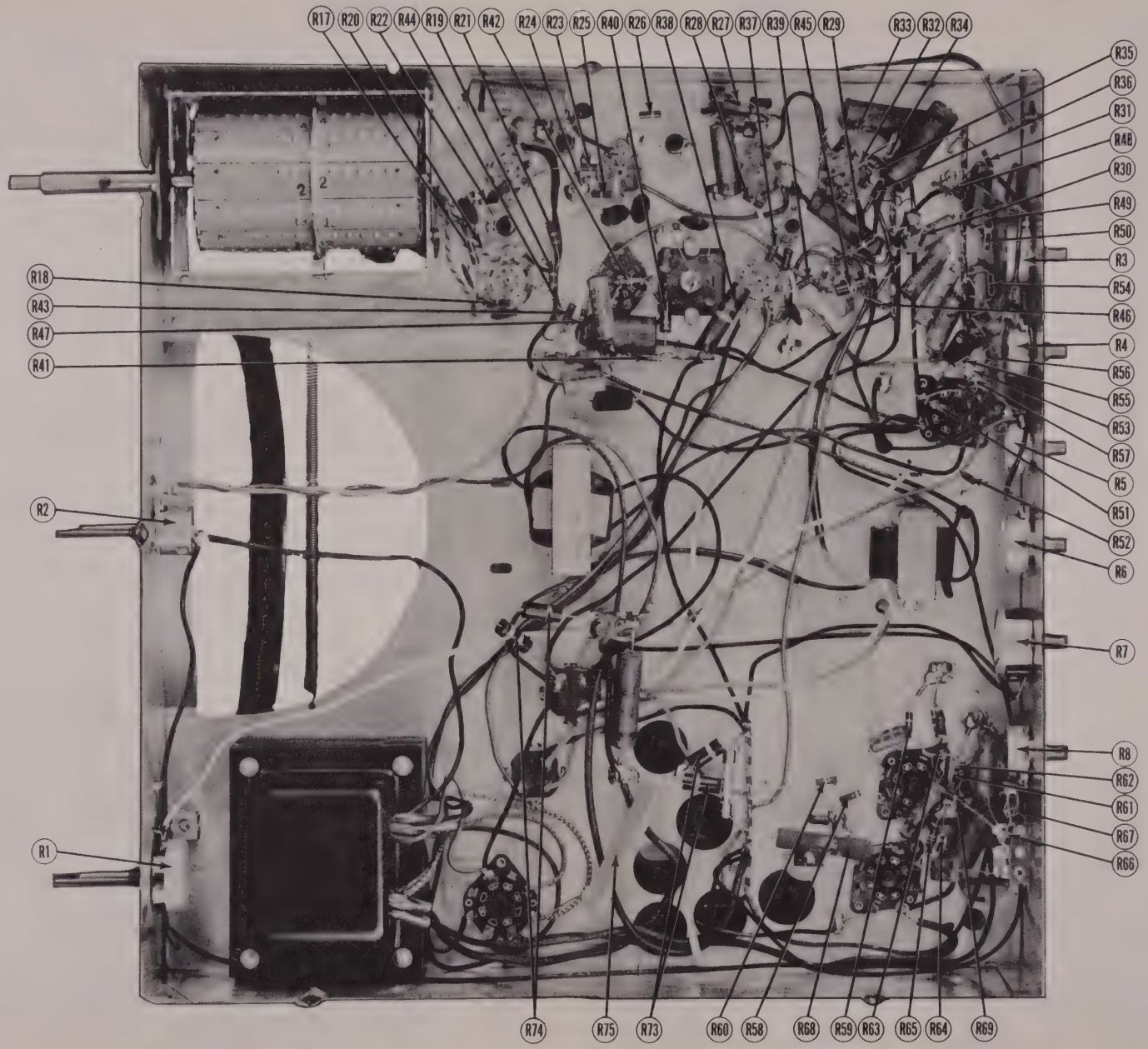
RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

BLOCK DIAGRAM

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2nd Video IF	6AU6	6AU6	7BK	
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	Video Amp.	6AU6	6AU6	7BK	
V7	DC Restorer-Sync. Sep.	6AU6	6AU6	7BK	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Det.-AF Amp.	6T8	6T8	9E	
V10	Audio Output	6AQ5	6AQ5	7BZ	
V11	Vert. Osc.-Vert. Amp.	6SN7GT	6SN7GT	8BD	
V12	Hor. Phase Inv.-Phase Det.	6SN7GT	6SN7GT	8BD	
V13	Hor. Osc.-Hor. Output	6BQ6GT	6BQ6GT		
†V14	HV Rectifier	1B3GT	1B3GT	3C	
V15	LV Rectifier	5V4G	5V4G	5L	
V16A	Picture Tube	10BP4	10BP4	12D	
B	Picture Tube	12LP4	12LP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	450	CE3A05	AF168J20A	UP1CJ1098			▫ Filter
B	40	450			BRH251A *			■ Filter
C	100	25						▲ Vert. Output Cath. Bypass
C2A	40	450	CE3A06	AF82J20F	UP9CJ915		TVL-25	▫ Filter
B	10	450						■ Decoupling
C	100	200						▲ Filter
C3	10	50	CE1D01	PRS50/10	BR105		TVA-14	Stabilizing Cap.
C4	5					NPOK-5		Fixed Trimmer
C5	120					GP2K-120		RF Decoupling
C6	1000						29C4	RF Filament Bypass
C7	100					GP1K-100		RF Coupling
C8	10					N750K-10		Fixed Trimmer
C9	20					NPOK-20		Osc. Grid Cap.
C10	68							Fixed Trimmer
C11	1000					GP2L-001		RF Bypass
C12	1000						29C4	Conv. Fil. Bypass
C13	120					GP2K-120		IF Coupling
C14	5000		CC0M00	1467-005	1D5D5	811-005	29C1	AGC Filter
C15	5000		CC0M00	1467-005	1D5D5	811-005	29C1	RF Bypass
C16	5000		CC0M00	1467-005	1D5D5	811-005	29C1	AGC Filter
C17	5000		CC0M00	1467-005	1D5D5	811-005	29C1	2nd V. IF Decoupling
C18	68		CC6A32	1468-000075	5W5Q7	GP1K-68	1FM-475	2nd V. IF Fil. Bypass
C19	.2	200	CP2T56	P488-22	GT4P2		TC-2	AGC Filter
C20	5000		CC0M00	1467-005	1D5D5	811-005	29C1	3rd V. IF Cath. Bypass
C21	5000		CC0M00	1467-005	1D5D5	811-005	29C1	3rd V. IF Decoupling
C22	10		CC6A22	1468-00001	5W5Q1	GP1K-10	MS-41	V. Det. Filter
C23	.05	200	CP2T40	P288-05	GT2S5		TM-15	Video Coupling
C24	.2	200	CP2T56	P488-22	GT4P2		TC-2	Video Coupling
C25	.05	400	CP2T40	P488-05	GT4S5		TM-15	Video Coupling
C26	.2	200	CP2T56	P488-22	GT4P2		TC-2	DC Res. Cath. Bypass
C27	1.5		CC9A12			NPOK-1.5		S. IF Coupling
C28	22		CC0A26	1468-000025	5W5Q25	GP1K-22	MS-425	S. IF Coupling
C29	5000		CC0M00	1467-005	1D5D5	811-005	29C1	S. IF Decoupling
C30	5000		CC0M00	1467-005	1D5D5	811-005	29C1	S. IF Decoupling
C31	.001	100	CP0M10	1468-001	1W5D1	GP2L-001	1FM-21	Diode Load Cap.
C32	1000		CC9M50	1468-001	1W5D1	GP2L-001	1FM-21	RF Bypass
C33	1000		CC9M50	1468-001	1W5D1	GP2L-001	1FM-21	De-emphasis
C34	1000	500	CP6T10	1468-001	1W5D1	GP2L-001	1FM-21	Audio Coupling
C35	.006	600	CP6T20	P688-006	GT6D6	GP2M-0056	TM-26	Audio Coupling
C36	.003	600	CP6T14	P688-003	GT6D3	GP2M-003	TM-23	Output Plate Bypass
C37	.002	600	CP6T12	P688-002	GT6D2	GP2M-002	TM-22	Integrator Net.
C38	.006	600	CP6T20	P688-006	GT6D6	GP2M-0056	TM-26	Integrator Net.
C39	.006	600	CP6T20	P688-006	GT6D6	GP2M-0056	TM-26	Integrator Net.
C40	.002	600	CP6T12	P688-002	GT6D2	GP2M-002	TM-22	Vert. Sync. Coupling
C41	.1	400	CP4T51	P488-1	GT4P1		TM-1	Vert. MV Feedback
C42	.03	600	CP6T36	P688-03	GT6S3		TM-13	Vert. MV Feedback
C43	.003	600	CP6T14	P688-003	GT6D3	GP2M-003	TM-23	Vert. MV Feedback
C44	.001	400	CP3S10	P688-001	GT6D1	GP2L-001	TM-21	RF Bypass
C45	.05	400	CP4T40	P488-05	GT4S5		TM-15	Integrator Net.
C46	.2	200	CP2T56	P488-22	GT4P2		TC-2	Fixed Trimmer
C47	10		CC6A22	1468-00001	5W5Q1	GP1K-10	MS-41	Hor. Sync. Coupling
C48	100	500	CM5A22	1468-0001	5W5T1	GP1K-100	1FM-31	Hor. Sync. Coupling
C49	.02	200	CP2T34	P488-02	GT2S2		TM-12	Osc. Bias Filter
C50	220		CC6A38	1468-00025	5W5T25	GP2K-220	1FM-325	Voltage Divider
C51	.006	600	CP6T20	P688-006	GT6D6	GP2M-0056	TM-26	AFC Coupling
C52	.2	200	CP2T56	P488-22	GT4P2		TC-2	Osc. Bias Filter
C53	470	500	CM6A38	1468-0005	5W5T5	GP2K-470	1FM-35	Hor. Osc. Grid Cap.
C54	.004	600	CP9S16	P688-004	GT6D4		TM-24	Damper Filter
C55	500	10000	CC9R45			410-500		HV Filter

* Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1	2000Ω	1	RV0W03	W-2000	43-2000	Contrast control, Wire Wound
R2A	500KΩ	½	RV0S03	Q13-133	M-60-Z	Volume control
B	Switch		Not Req.	76-1	SW-A	Attach to R2A per instructions
R3	50KΩ	½	RV0C12	Q11-123	M-44-S	Brightness control
R4	1 Meg.	½	RV4C08	Q11-137	M-61-S	Vert. hold control
R5	3 Meg.	½	RV4C07	Q11-140		Height control
R6	2500Ω	½	RV0C13	Q11-112	M-15-S	Vert. linearity control
R7	1200Ω	2	RV0W02	PR-25-1500	43-1200	Focus control, Wire Wound
R8	250KΩ	½	RV0C14	Q11-128	M-55-S	Horiz. hold control

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES (ALL RESISTORS ARE 10% UNLESS OTHERWISE STATED)
R9	3900Ω 20%	½		BTS-3900	RF Grid
R10	10KΩ 20%	½		BTS-10K	RF Plate Coil Shunt
R11	2200Ω 20%	½		BTS-2200	RF Decoupling
R12	4700Ω	½		BTS-4700	Conv. Grid
R13	220KΩ 20%	½		BTS-220K	Conv. Grid
R14	10KΩ 20%	½		BTS-10K	Osc. Grid
R15	47KΩ 20%	½		BTS-47K	AGC Network
R16	4700Ω	½		BTS-4700	Osc. Plate
R17	10KΩ	½	RC22A103K		1st Video IF Grid
R18	82Ω	½	RC22A820K		1st Video IF Cathode
R19	8200Ω	½	RC22A822K		1st Video IF Transformer Shunt
R20	680Ω 20%	½	RC22A681M	BTS-680	AGC Network
R21	100Ω 20%	½	RC22A101M		Decoupling Network
R22	100Ω	½	RC22A101K		2nd Video IF Cathode
R23	100Ω 20%	½	RC22A101M		Decoupling Network
R24	8200Ω	½	RC22A822K		3rd Video IF Transformer Shunt
R25	82Ω	½	RC22A820K		3rd Video IF Cathode
R26	1.5 Meg.	½	RC22A155K	BTS-1.5 Meg.	AGC Network
R27	4700Ω	½	RC22A472K	BTS-4700	Video Det. Load
R28	1 Meg. 20%	½	RC22A105M	BTS-1 Meg.	Video Amp. Grid
R29	6800Ω	1	RC24A682K	BTA-6800	Video Amp. Plate
R30	47KΩ 20%	½	RC22A473M	BTS-47K	Isolation
R31	100KΩ 20%	½	RC22A104M	BTS-100K	Voltage Divider
R32	2.2 Meg.	½	RC22A225K	BTS-2.2 Meg.	Sync. Sep. Grid
R33	22KΩ 20%	½	RC22A223M	BTS-22K	Sync. Sep. Cathode
R34	22KΩ 20%	½	RC22A223M	BTS-22K	Sync. Sep. Cathode
R35	180KΩ	½	RC22A184K	BTS-180K	Sync. Sep. Plate
R36	15KΩ 20%	½	RC22A153M	BTS-15K	Sync. Sep. Plate
R37	47KΩ 20%	½	RC22A473M		Sound IF Grid
R38	10KΩ	W	RC25A103K		Sound IF Decoupling See Note 1
R39	680Ω 20%	1	RC22A681M	BTS-680	Voltage Divider
R40	33Ω 20%	1	RC24A330M		Balancing
R41	47KΩ 20%	½	RC22A473M	BTS-47K	De-emphasis
R42	12KΩ	½	RC22A123K	BTS-12K	Ratio Det. Diode Load
R43	10Ω 20%	½	RC22A100M	BW-½-10	AF Cathode
R44	4.7 Meg. 20%	½	RC22A475M	BTS-4.7 Meg.	AF Grid
R45	150KΩ	1	RC24A154K	BTA-150K	AF Plate
R46	680Ω 20%	½	RC22A681M	BTS-680	Decoupling
R47	47Ω	½	RC22A470K	BW-½-47	Feedback
R48	22KΩ 20%	½	RC22A223M	BTS-22K	Integrator
R49	8200Ω	½	RC22A822K	BTS-8200	Integrator
R50	8200Ω	½	RC22A822K	BTS-8200	Integrator
R51	2.4 Meg. 5%	½			Vert. Output Grid
R52	680Ω 20%	½	RC22A681M	BTS-680	Vert. Output Cathode
R53	47KΩ 20%	½	RC22A473M	BTS-47K	Feedback Network
R54	22KΩ 5%	½	RC22A223J	BTS-22K-5%	Differentiator
R55	470KΩ 20%	½	RC22A474M	BTS-470K	Vert. MV Grid
R56	8200Ω	½	RC22A822K	BTS-8200	Vert. Peaking
R57	3.3 Meg. 20%	½	RC22A335M	BTS-3.3 Meg.	Vert. MV Plate
R58	47KΩ 20%	½	RC22A473M	BTS-47K	Horiz. Phase Inv. Grid
R59	10KΩ	½	RC22A103K	BTS-10K	Horiz. Phase Inv. Cathode
R60	22KΩ	½	RC22A223K	BTS-22K	Horiz. Phase Inv. Plate
R61	220KΩ 20%	½	RC22A224M	BTS-220K	Horiz. Phase Det. Cathode
R62	1 Meg.	½	RC22A105K	BTS-1 Meg.	Horiz. Phase Det. Grid
R63	50KΩ 5%	1	RC22A473K	BTA-47K-5%	Voltage Divider
R64	8200Ω	½	RC22A822K	BTS-8200	Horiz. Peaking
R65	180KΩ	½	RC22A184K	BTS-180K	Horiz. Osc. Grid
R66	22KΩ	½	RC22A223K	BTS-22K	Voltage Divider
R67	100KΩ 20%	½	RC22A104M	BTS-100K	Voltage Divider
R68	15KΩ	10	RW0B43	AB-15,000	Horiz. Output Screen-Wire Wound
R69	1 Meg.	½	RC22A105K	BTS-1 Meg.	Feedback
R70	3000Ω	20	RW0B29	DG-3000	Damper Filter-Wire Wound
R71	2.2Ω	2	RW0L01		HV Rect. Filament-Wire Wound
R72	680KΩ 20%	2	RC4T52		HV Filter
R73	4700Ω	2	RC25A472M	BW-2-4700	Filter See Note 2
R74	680Ω	2	RC25A681K	BW-2-680	Focus Coil Shunt See Note 2
R75	100Ω	10	RW0B12	AB-100	Isolation-Wire Wound

Note 1. Some models use 13KΩ resistor in this application.
Note 2. Some models use two resistors in series to obtain required resistance and wattage.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC at 1.5A	800VCT .190ADC	5VAC at 2A	6.3VAC at 5.3A SEC. 4 6.3VAC at .8A	TPOY01			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	330Ω Tap at 175Ω	SEC. 1 10.6Ω SEC. 2 0Ω	TS0H02	A-8117		TFB-1	Hor. Output Trans.
T3A	730Ω	11.5Ω	TS0V01 ①	A-8113			Vert. Output Trans.
B			TS0V02 ②				
T4A	13.5Ω		TC0D01 ①	DY-1			Hor. Deflection Coil
B	64Ω						Vert. Deflection Coil
C			LC0D02 ②				Hor. Deflection Coil
D							Vert. Deflection Coil
T5A	250Ω		LC0F01 ①				Focus Coil
B			LC0F02 ②				Focus Coil

① Used with 10" tube.
② Used with 12½" tube.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T6A	7.2KΩ	3.6Ω	465Ω	.5Ω	TA-0022 ①	A-3849 ③			① Used with 10" tube.
B					TA-0023 ②				② Used with 12½" tube.
									③ Drill one new mounting hole.

SPEAKER

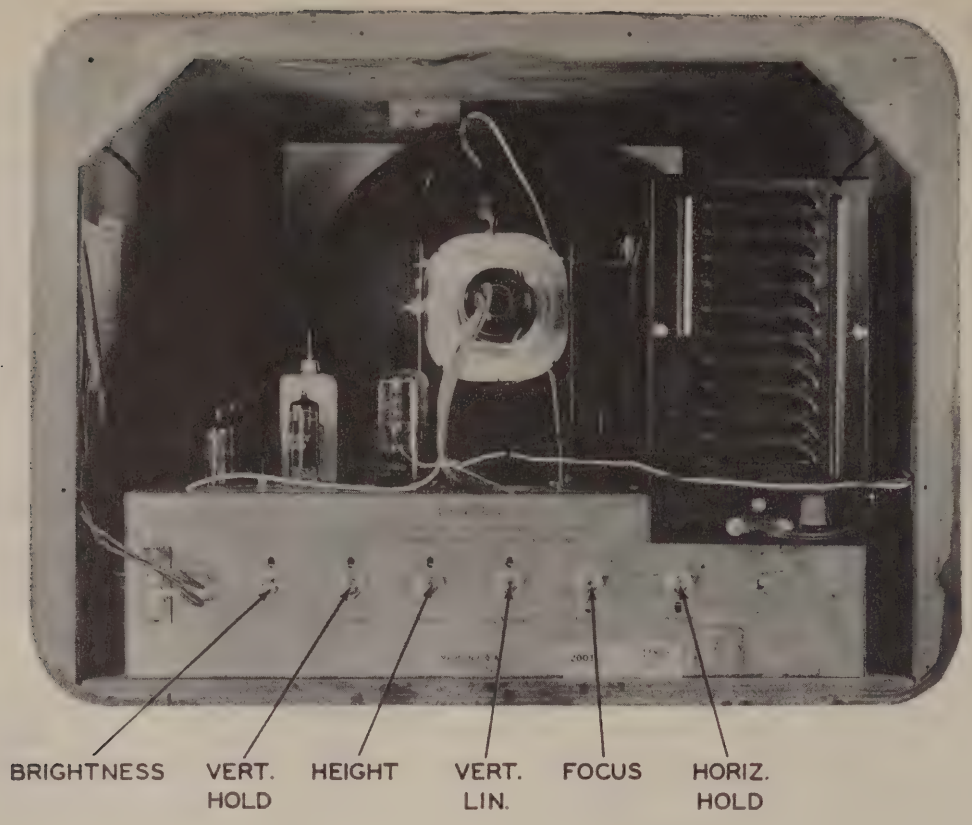
ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	PM	3.5Ω	SP4003		46A1	
	CONE DIA.	V. C. DIA.				
SP2	3 7/8" x 5 7/8"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: MEISSNER PART No.	NOTES
L1	Ant. Coils	0Ω				Part of tuner.
L2	RF Plate, Mixer Grid and Osc.	0Ω				Part of tuner.
L3	Fil. Choke	0Ω				Part of tuner.
L4	Fil. Choke	0Ω				Part of tuner.
L5	Sound Trap	0Ω				Part of tuner.
L6	1st Video IF	.1Ω				Part of tuner.
L7	2nd Video IF	.1Ω		T10I04		
L8	3rd Video IF	.1Ω		T10I05		
L9	4th Video IF	.1Ω		T10D24		
L10	Peaking	10Ω		LC0V06		Wound on 15KΩ resistor
L11	Peaking	15Ω		LC0V04		Wound on 220KΩ resistor
L12	Peaking	10Ω		LC0V05		Wound on 12KΩ resistor
L13	Peaking	12Ω		LC0V07		Wound on 220KΩ resistor
L14	Sound IF	12Ω		L10T14		
L15	Ratio Det. Transformer	5.8Ω	.2Ω	T10D25		

MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M1	RF Tuner	AR0T01	Less tubes.
M2	Fuse	FC0M01	.25A 250V
M3	Ion Trap	T10P01	Permanent magnet type
M4	Crystal	IN60	Video detector
	Cabinet Back	BZ0B30	10" tube
	Cabinet Back	BZ0B31	12½" tube
	Safety Glass	GZ0S06	10" tube
	Safety Glass	GZ0S02	12½" tube
	Cap	HC0M14	Back cover
	Spring	HC0S69	Safety glass retainer
	Spring	HC0S92	Dial retainer
	Spring	HC0S93	Control knob
	Spring	HC0S94	Concentric knob retainer
	Knob	KC0B20	Contrast, On-Off volume
	Knob	KC0B21	Fine tuning
	Knob	KY0B03	Channel selector



DISASSEMBLY INSTRUCTIONS

1. Remove three push-on type control knobs.
2. Remove six screws holding rear cover. Remove cover.
3. Loosen antenna terminal screws. Remove built-in antenna lead lugs.
4. Unsolder speaker leads from terminals on top rear of chassis.
5. Remove four 5/16" hex nuts holding chassis. Remove chassis.
6. Remove two phillips head screws holding speaker. Remove speaker.

DAVID BOGEN MODEL HO50

DAVID BOGEN MODEL HO50

ON-OFF SWITCH

DAVID BOGEN MODEL HO50

DAVID BOGEN MODEL HO50

TRADE NAME	David Bogen, Model HO50
MANUFACTURER	David Bogen Co., Inc., 663 Broadway, New York 12, New York
TYPE SET	AC Operated Booster Audio Amplifier
TUBES(SIX)	Types 6SL7GT AF-Phase Inverter, 6SN7GT Driver, (2) 807 Power Output, 5Y3GT Rectifier, 5R4GY Rectifier
POWER SUPPLY	110-120 Volts AC RATING 1.35 Amp. at 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

DAVID BOGEN
MODEL HO50

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DAVID BOGEN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	AF Amp.-Phase Inverter	6SL7GT	6SL7GT	8BD	
V2	Driver	6SN7GT	6SN7GT	8BD	
V3	Power Output	807	807		
V4	Power Output	807	807		
V5	Rectifier	5Y3GT	5Y3GT	5T	
V6	Rectifier	5R4GY	5R4GY	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DAVID BOGEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	4	600		GL600/4	TLAD-6040		AP-46	Filter
C2A	8	500		GL475/8-8	EB10018		CL-88	Filter Green-Yellow
B	8	500						Filter Red-Black
C3	10	450		PRS450/10	BR1045		UT-10	Decoupling
C4	50	50		PRS50/50	BR505		TVA-16	AF Cathode Bypass
C5	50	50		PRS50/50	BR505		TVA-16	Bias Filter
C6	.05	400		P488-05	GT4S5		TM-15	Audio Coupling
C7	.05	400		P488-05	GT4S5		TM-15	Audio Coupling
C8	.05	400		P488-05	GT4S5		TM-15	Audio Coupling
C9	.05	400		P488-05	GT4S5		TM-15	Tone Compensation
C10	.1	400		P488-1	GT4P1		TM-1	Line Filter

CONTROLS

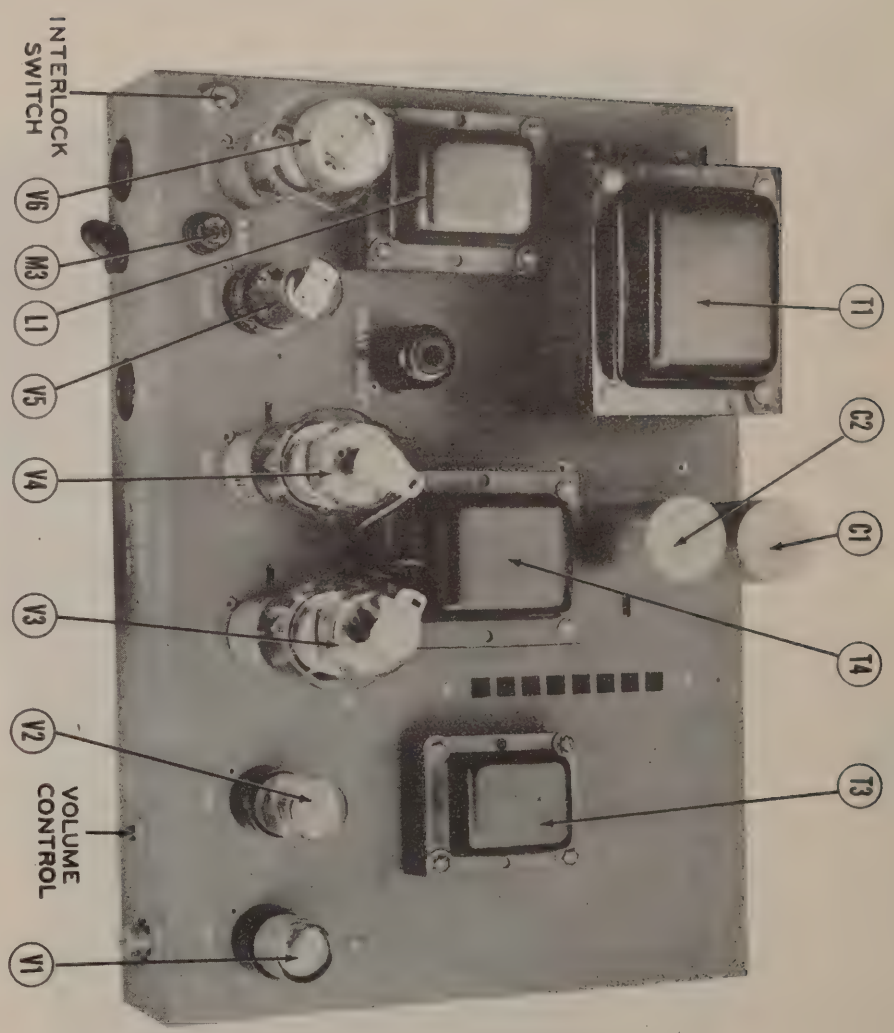
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: David Bogen PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1	500KΩ	½	V-275	Q13-133	M-60-Z	Volume control

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DAVID BOGEN PART No.	IRC PART No.	IDENTIFICATION CODES
R2	3000Ω	½		BTS-3300	AF Cathode
R3	470Ω	1		BTA-470	AF Cathode
R4	270KΩ	½		BTS-270K	AF Plate
R5	3900Ω 5%	1		BTA-3900-5%	Phase Inv. Cathode
R6	47KΩ	½		BTS-47K	Phase Inv. Grid
R7	270KΩ	½		BTS-270K	Phase Inv. Plate
R8	1 Meg.	½		BTS-1 Meg.	Tone Compensation
R9	10KΩ	½		BTS-10K	Decoupling
R10	1 Meg.	½		BTS-1 Meg.	Driver Grid
R11	1 Meg.	½		BTS-1 Meg.	Driver Grid
R12	750Ω	½			Driver Cathode
R13	47KΩ	½		BTS-47K	Feedback
R14A	10KΩ	50		EPA-50K *	Bleeder, Wire Wound
B	40KΩ				Bleeder, Wire Wound
R15	1000Ω	10		ABA-1000 #	Bias Control, Wire Wound, Adjustable
R16	47KΩ	½		BTS-47K	Series Neon
R17	47KΩ	½		BTS-47K	Series Neon

* Set slider at 10KΩ from one end.
\# Set slider to read -25 VDC from ground side.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	DAVID BOGEN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at 1.35A	1180VCT .120ADC SEC. 4 5VAC at 2A	620VCT .055ADC SEC. 5 6.3VCT at 2.7A	5VAC at 2A	T361-2			

TRANSFORMER (INPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		DAVID BOGEN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2					T-6				Used with low impedance input.

TRANSFORMER (DRIVER)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	INDUCTANCE		DC RES.		DAVID BOGEN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T3	10 Henries CT		140Ω CT		T-119-1				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		DAVID BOGEN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T4	3KΩ CT	500Ω 125Ω 15Ω 8Ω 4Ω	65Ω CT	8.2Ω 4Ω .32Ω .25Ω .2Ω	T256-1	A-3301 †	A-3133 †	BO-9 †	† Drill new mounting holes.

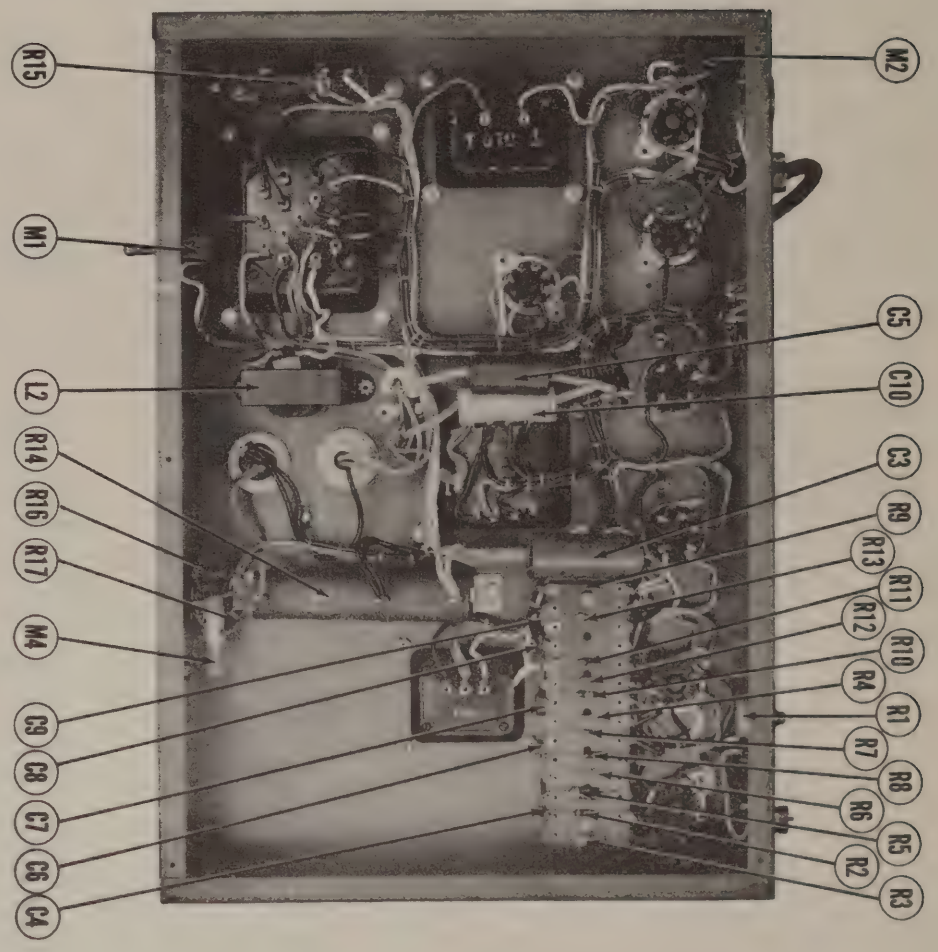
FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	DAVID BOGEN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.120A	50Ω	2.5Henries	T510-1	C-2304 †	C-2974 †	TR-4200†	† Drill new mounting holes.
L2	.055A	190Ω	5.5Henries	T501	C-1080	C-2977	R-885 ‡	‡ Drill one new mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	DAVID BOGEN PART No.	NOTES
M1	Switch		On-Off
M2	Switch		Interlock
M3	Fuse		3 Amp. AGC
M4	Lamp		Neon (NE51)

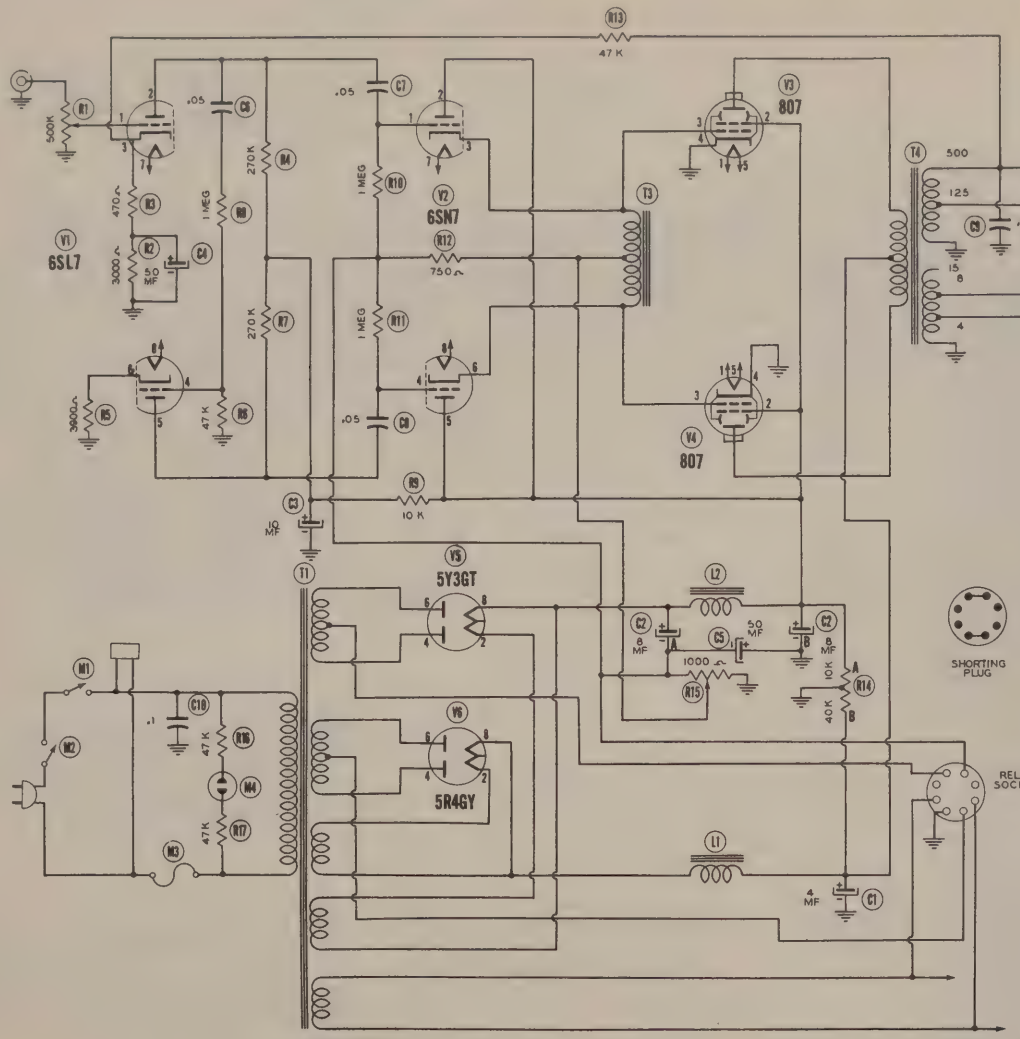
CHASSIS—BOTTOM VIEW

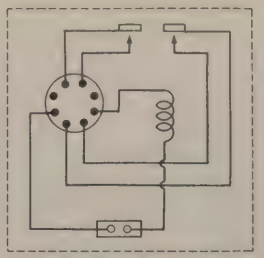


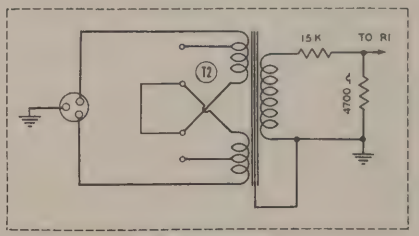
SET 84 FOLDER 5

DAVID BOGEN MODEL HO50

DAVID BOGEN MODEL HO50







THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Top Cap
V 1	6SL7GT	0V.	150VDC	1.7VDC	0V.	150VDC	1.8VDC	¶2.8VAC	¶3.5VAC	
V 2	6SN7GT	-27VDC	290VDC	-22VDC	-27VDC	290VDC	-22VDC	¶2.8VAC	¶3.5VAC	
V 3	807	¶2.8VAC	290VDC	-22VDC	0V.	¶3.5VAC				480VDC
V 4	807	¶2.8VAC	290VDC	-22VDC	0V.	¶3.5VAC				480VDC
V 5	5Y3GT	0V.	300VDC	0V.	315VAC	0V.	315VAC	0V.	300VDC	
V 6	5R4GY	0V.	490VDC	0V.	600VAC	0V.	600VAC	0V.	490VDC	

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Top Cap
V 1	6SL7GT	500KΩ	†280KΩ	3KΩ	47KΩ	†280KΩ	4KΩ	.1Ω	.1Ω	
V 2	6SN7GT	1 Meg	†175Ω	800Ω	1 Meg	†175Ω	800Ω	.1Ω	.1Ω	
V 3	807	.1Ω	†175Ω	800Ω	0Ω	.1Ω				#400Ω
V 4	807	.1Ω	†175Ω	790Ω	0Ω	.1Ω				#380Ω
V 5	5Y3GT	Inf.	10KΩ	Inf.	+90Ω	Inf.	+94Ω	Inf.	10KΩ	
V 6	5R4GY	Inf.	40KΩ	Inf.	38Ω	Inf.	42Ω	Inf.	40KΩ	

¶ 6.3VAC measured across filaments.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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† Measured from pin 8 of V5.
# Measured from pin 8 of V6.
+ Measured from power transformer center-tap.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

PHOTOFACT* Folder

EMERSON MODELS
608A (CH. 120089B), 626
(CH. 120104B, CH. 120104BJ)

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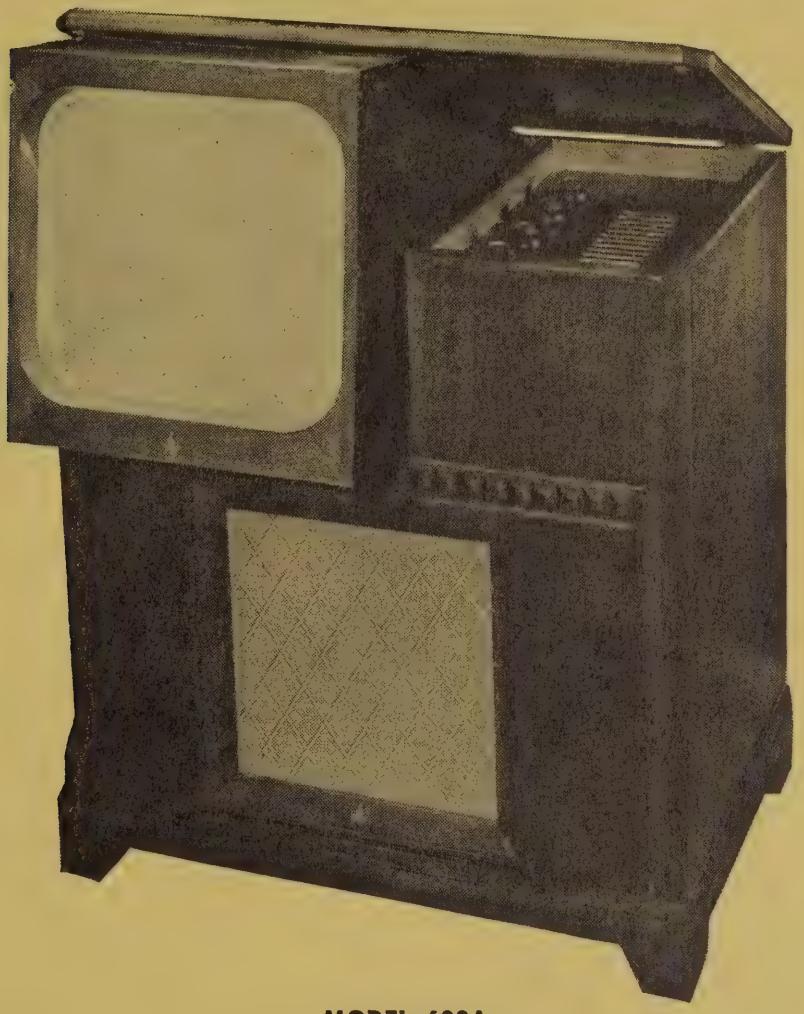

MODEL 608A

EMERSON MODELS
608A (CH. 120089B), 626
(CH. 120104B, CH. 120104BJ)

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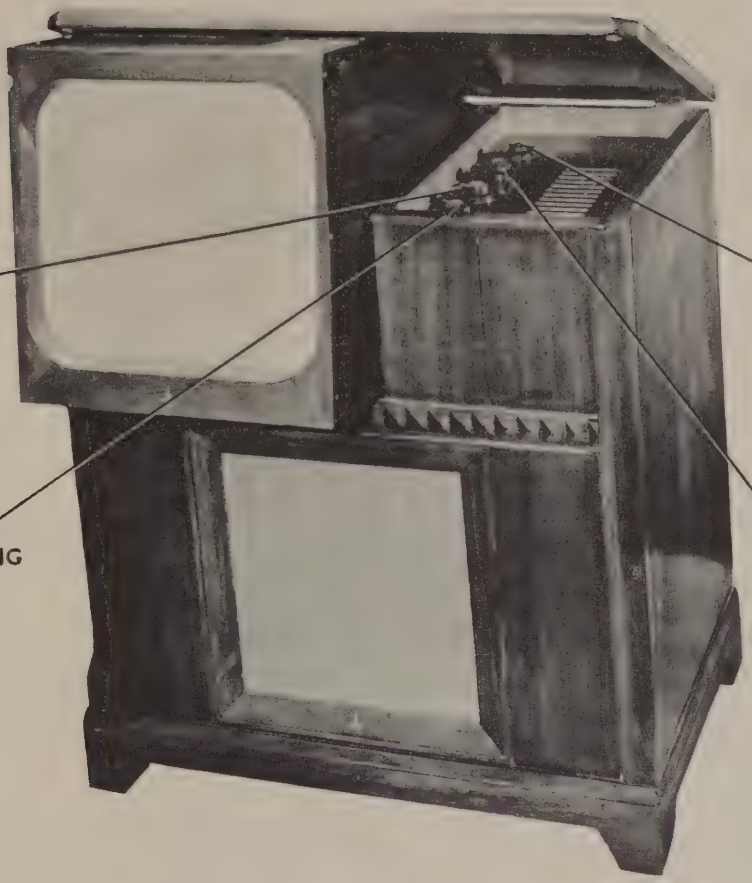
Date 2/50 Set No. 84—Folder No. 6



EMERSON MODELS 608A (Ch. 120089B), 626 (Ch. 120104B, BJ)

EMERSON MODEL 608A

TRADE NAME	Emerson Models 608A (Ch. 120089B), 626 (Ch. 120104B, 120104BJ)
MANUFACTURER	Emerson Radio and Phono Corp., 111 Eighth Ave., New York 11, N.Y.
TYPE SET	Television Receiver
TUBES	Twenty Six
POWER SUPPLY	110 - 120 Volts AC - 60 Cycle — RATING 2.25 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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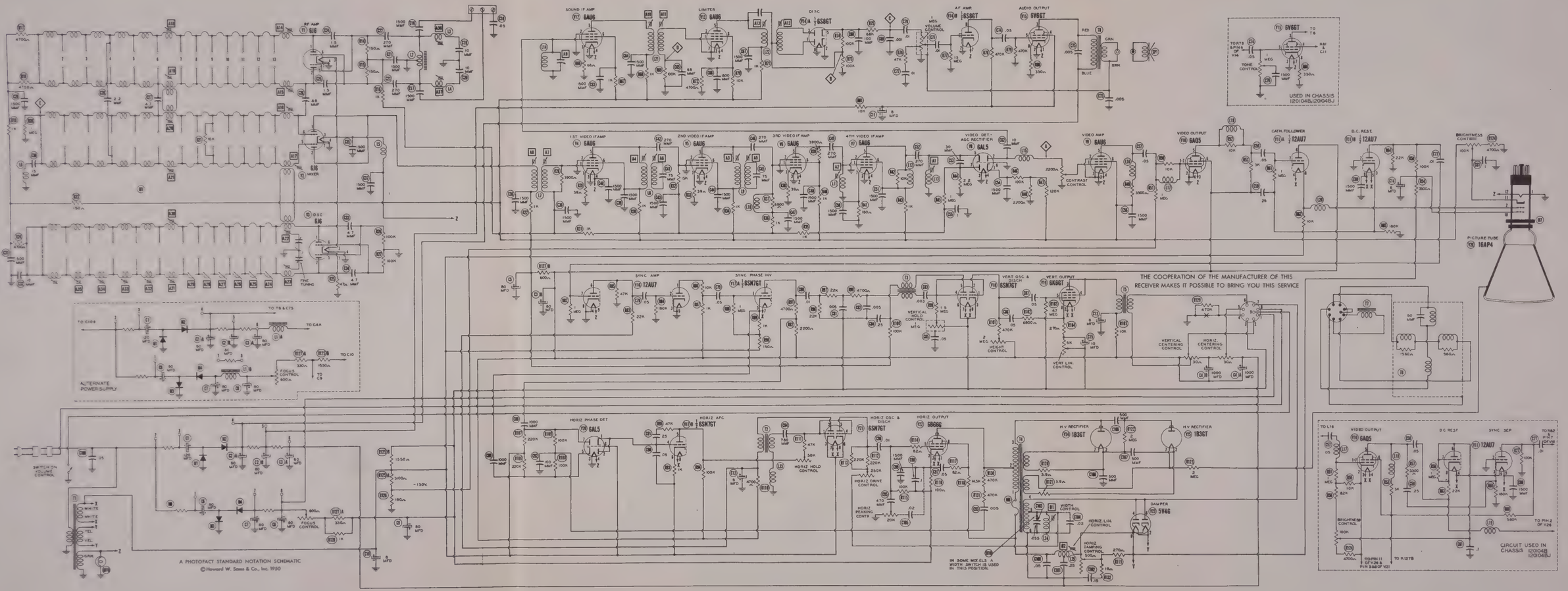
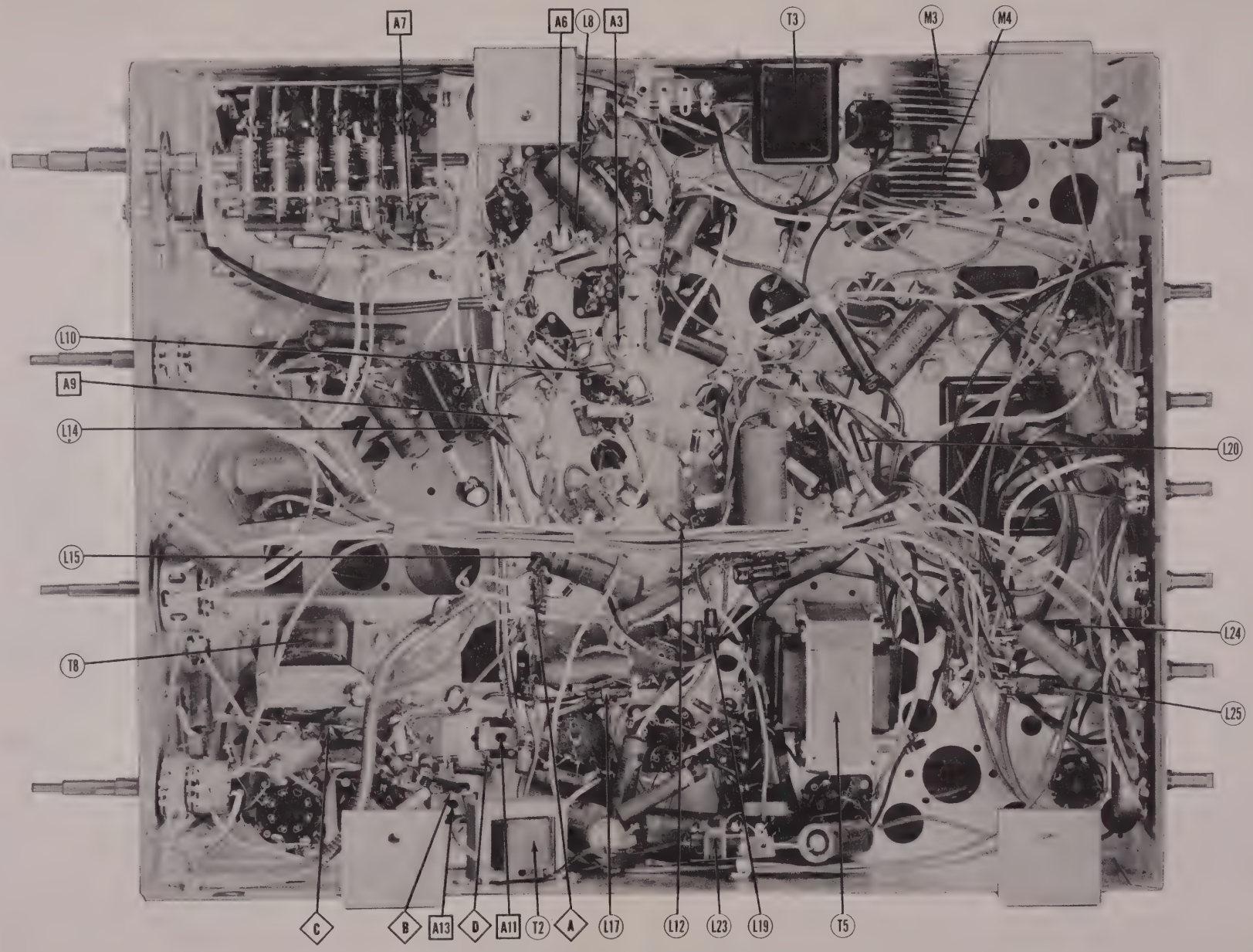
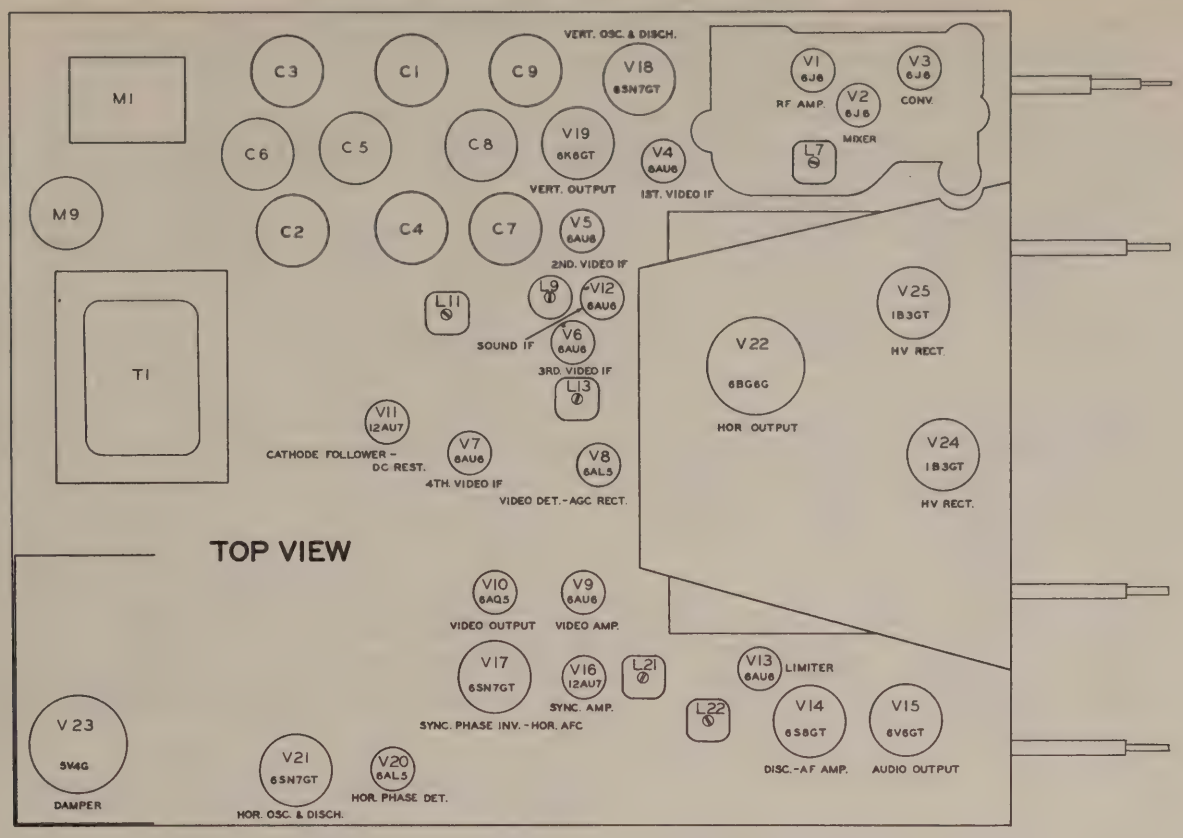

EMERSON MODELS 608A (Ch. 120089B), 626 (Ch. 120104B, BJ)
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
ALTERNATE POWER SUPPLY
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1950
USED IN CHASSIS 120104B,120104BJ
CIRCUIT USED IN CHASSIS 120104B 120104BJ
IN SOME MODELS A WIDTH SWITCH IS USED IN THIS POSITION
PICTURE TUBE V16 16AP4
RF AMP 6J6
MIXER 6J6
OSC 6J6
SOUND IF AMP 6AU6
LIMITER 6AU6
DISC 6S8GT
AF AMP 6S8GT
AUDIO OUTPUT 6V6GT
1ST VIDEO IF AMP 6AU6
2ND VIDEO IF AMP 6AU6
3RD VIDEO IF AMP 6AU6
4TH VIDEO IF AMP 6AU6
VIDEO DET., AGC RECTIFIER 6AL5
VIDEO AMP 6AU6
VIDEO OUTPUT 6AQ5
CATH. FOLLOWER 12AU7
D.C. REST. 12AU7
SYNC. AMP 12AU7
SYNC PHASE INV 6SN7GT
VERT. OSC & DISCH 6SN7GT
VERT. OUTPUT 6K6GT
HORIZ PHASE DET 6AL5
HORIZ AFC 6SN7GT
HORIZ OSC & DISCH 6SN7GT
HORIZ OUTPUT 6BG6G
H.V. RECTIFIER 1B3GT
H.V. RECTIFIER 1B3GT
DAMPER 5Y4G
SWITCH ON VOLUME CONTROL
FOCUS CONTROL
-130V
TONE CONTROL
CONTRAST CONTROL
BRIGHTNESS CONTROL
VERTICAL HOLD CONTROL
HEIGHT CONTROL
VERT. LIN. CONTROL
VERTICAL CENTERING CONTROL
HORIZ. CENTERING CONTROL
HORIZ. HOLD CONTROL
HORIZ. DRIVE CONTROL
HORIZ. PEAKING CONTR
WIDTH CONTROL
HORIZ. LIN. CONTROL
HORIZ. DAMPING CONTROL
SYNC. SEP.

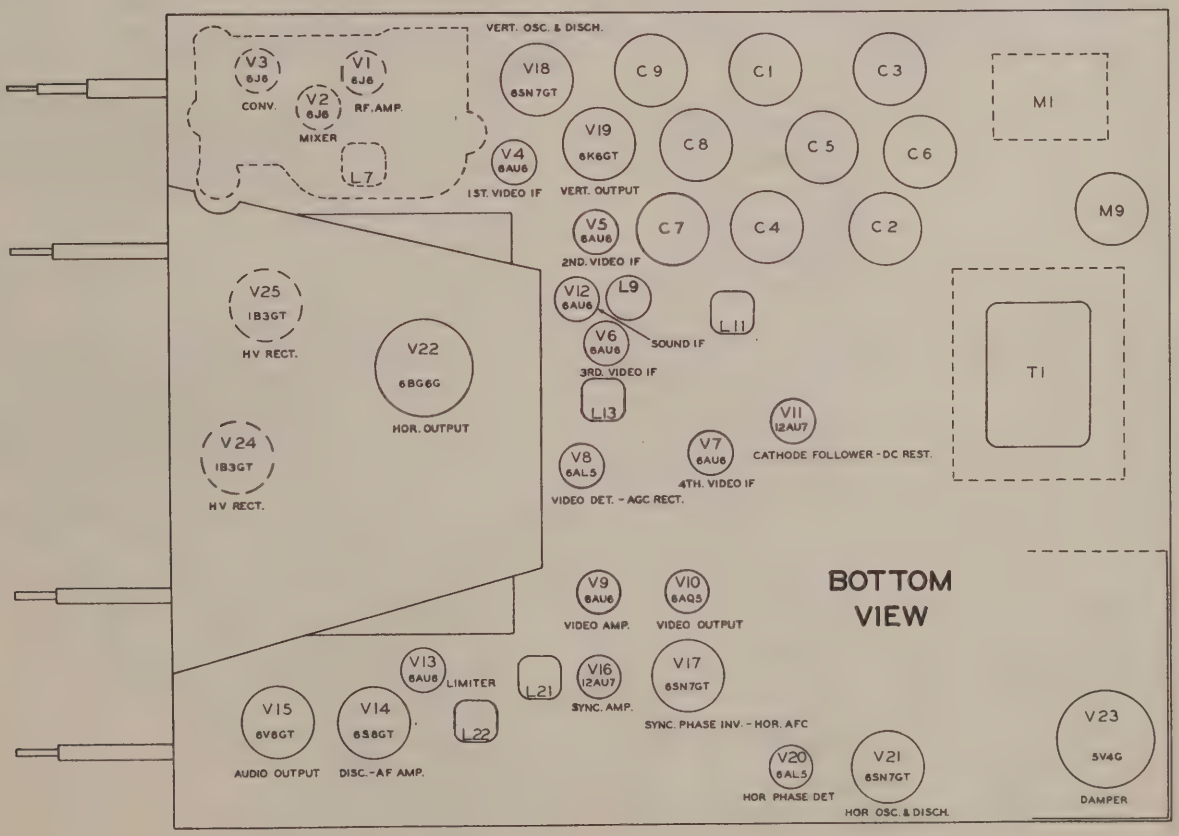
CHASSIS TOP VIEW

EMERSON MODELS 608A (Ch. 120089B), 626 (Ch. 120104B, BJ)



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The picture tube need not be removed during alignment if an adaptor cable is used to complete the deflection and focus circuits.
The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V21).
Use an isolation transformer to protect the test equipment.
Connect the negative lead of a 3 volt battery to the junction of R31 and R35, connect the positive lead to chassis.

VIDEO IF ALIGNMENT

If set has tuner #470233, remove the local oscillator tube (V3) to eliminate the possibility of erroneous indications. If set has tuner #470452, remove the channel 13 segment of the convertor section of the tuner turret and turn the channel selector to channel 13 to disable the local oscillator.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	25.2MC (Unmod.)	13 (See note above)	DC Probe to Point (A) Common to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator to obtain 1 volt reading.
2.	Direct	"	25.3MC	"	"	A2	"
3.	Direct	"	22.3MC	"	"	A3	"
4.	Direct	"	21.8MC	"	"	A4	"
5.	Direct	"	21.25MC	"	"	A5, A6	Adjust for MINIMUM deflection.

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	23MC (10MC Sweep)	21.75MC 25.75MC	13	Vert. Amp. to Point (A) Low side to chassis.	A7, A8	Adjust A7 and A8 to place markers as shown in Fig 1. If necessary retouch A1 thru A6 to obtain response curve similar To Fig 1.

SOUND IF ALIGNMENT

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 2 (plate) of 6AL5 (V8). Low side to chassis.	4.5MC (1MC Sweep)	4.5MC	Any channel not used locally	Vert. Amp. to Point (D) Low side to chassis.	A9, A10, A11	Adjust for maximum amplitude and symmetry as per Fig 2.
8.	.01MFD	"	"	"	"	Vert. Amp. to Point (B) Low side to chassis.	A12, A13	Adjust A12 so 4.5MC occurs at center of crossover lines as per Fig 3. Adjust A13 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT (TUNER #470233)

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Replace the local oscillator tube V3.
Connect a 1000MMF capacitor from the grid of the first video amp. (V4) to chassis, using shortest possible leads.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC Sweep)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to Point (E) Low side to chassis.	A14, A15, A16, A17	Adjust for response curve similar to Fig 4. with markers above 70%.
10.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"		Check for response curve similar to Fig 4. If markers fall below 70% on any channel, make slight adjustment of A14, A15, A16, and A17 with selector switch set for that channel. Recheck all high band channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
11.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A18, A19, A20, A21	Adjust for response curve similar to Fig 4 with markers shown above 70%.
12.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"		Check for response curve similar to Fig 4. If markers are below 70% on any channel make slight adjustment of A18, A19, A20 and A21 with selector switch set for that channel. Recheck all low band channels to see that they have not been seriously effected.
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

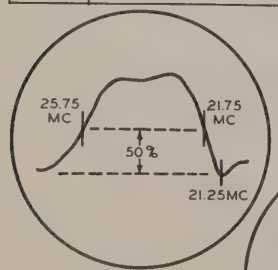


FIG. 1

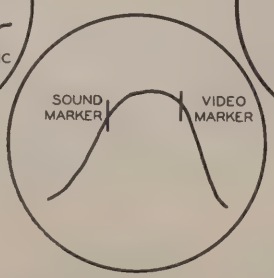


FIG. 4

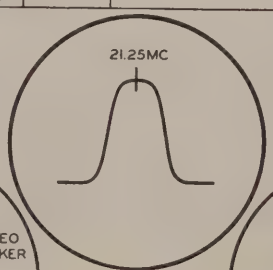


FIG. 2

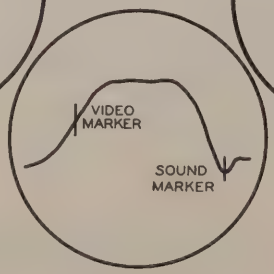


FIG. 5

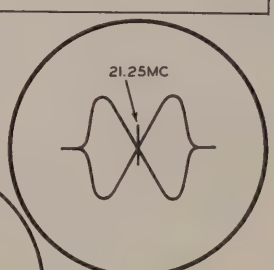


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT (TUNER #470233)

Set the fine tuning control to the mid-position of its range.
Remove the 1000MMF capacitor from the grid of V4.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC Sweep)	211.25MC 215.75MC	13	Vert. Amp. to Point (A) Low side to chassis.	A22, A23	Adjust to place markers as shown in Fig 5. Keep slug pairs at approximately the same relative position.
14.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"	A24	Adjust to place markers as shown in Fig 5.
			201MC (10MC SWP)	199.25MC 203.75MC	11		A25	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A26	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A27	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A28	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A29	
15.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A30, A31	Adjust to place markers as shown in Fig 5. Keep slug pairs at approximately the same relative position.
16.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"	A32	Adjust to place markers as shown in Fig 5.
			69MC (10MC SWP)	67.25MC 71.75MC	4		A33	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A34	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A35	

WAVE TRAP ADJUSTMENT

Wave traps A36 and A37 are used for specific types of interference and their alignment will depend upon the type encountered. With the receiver tuned to the channel having the interference set fine tuning control until interference is at maximum. Adjust A36 and A 37 for minimum interference in the picture and sound, keeping the cores at approximately the same relative position. Turn one core 1/2 turn, adjust the other for minimum interference.

RF ALIGNMENT (TUNER #470452)

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Replace the channel 13 segment of the tuner turret.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (J) Low side to chassis.	A501, A502, A503	Adjust for response curve similar to Fig 4 with markers above 70%
10.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all channels for response similar to Fig 4. If markers are below 70% on any channel, make slight adjustment of A501, A502, and A503 with selector switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

OSCILLATOR ALIGNMENT (TUNER #470452)

The overall oscillator circuit adjustment A504 is pre-set at the factory and should not be adjusted in the field.
The individual channel oscillator adjustments are reached through a hold just to the right of the channel selector switch shaft. The proper adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Set the fine tuning control to the mid-position of its range.
The sweep generator output lead shoul be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC Sweep)	211.25MC 215.75MC	13	Vert. Amp. to Point (A) Low side to chassis.	A505	Adjust for marker placement as shown in Fig 5.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A506	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A507	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A508	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A509	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A510	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A511	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A512	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A513	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A514	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A515	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A516	

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	70VDC	70VDC	6.3VAC	0V	-.8VDC	-.8VDC	0V		
V 2	6J6	130VDC	130VDC	6.3VAC	0V	0V	0V	0V		
V 3	6J6	65VDC	65VDC	6.3VAC	0V	§-4VDC	§-3.6VDC	.3VDC		
V 4	6AU6	-.7VDC	0V	0V	6.3VAC	115VDC	115VDC	.2VDC		
V 5	6AU6	-.6VDC	0V	0V	6.3VAC	115VDC	115VDC	.3VDC		
V 6	6AU6	-.6VDC	0V	0V	6.3VAC	100VDC	115VDC	.3VDC		
V 7	6AU6	0V	0V	0V	6.3VAC	115VDC	115VDC	1.3VDC		
V 8	6AL5	1.5VDC	-2VDC	0V	6.3VAC	0V	0V	-.6VDC		
V 9	6AU6	0V	0V	0V	6.3VAC	85VDC	125VDC	0V		
V 10	6AQ5	-.8VDC	0V	6.3VAC	0V	55VDC	175VDC	-.8VDC		
V 11	12AU7	55VDC	0V	4.5VDC	♦6.3VAC	♦6.3VAC	♦270VDC	♦80VDC	♦100VDC	♦0V
V 12	6AU6	0V	0V	0V	6.3VAC	115VDC	120VDC	.8VDC		
V 13	6AU6	-.5VDC	0V	0V	6.3VAC	120VDC	35VDC	0V		
V 14	6S8GT	-.4VDC	0V	-.5VDC	0V	-.2VDC	80VDC	6.3VAC	0V	TOP CAP -.5VDC
V 15	6V6GT	0V	0V	230VDC	185VDC	.1VDC	0V	6.3VAC	8.4VDC	
V 16	12AU7	140VDC	-.2VDC	0V	0V	0V	45VDC	-.3VDC	0V	6.3VAC
V 17	6SN7GT	♦16VDC	♦150VDC	♦1.2VDC	♦1.3VDC	♦.6VDC	♦0V	♦0V	♦6.3VAC	
V 18	6SN7GT	¶-105VDC	¶75VDC ¶220VDC	¶0V	¶-105VDC	¶250VDC	¶0V	♦0V	♦6.3VAC	
V 19	6K6GT	0V	♦6.3VAC	¶280VDC	¶280VDC	¶0V	¶37VDC	♦0V	¶3VDC ¶37VDC	
V 20	6AL5	♦-.4VDC	♦-.4VDC	0V	6.3VAC	♦3VDC	♦0V	♦-3.8VDC		
V 21	6SN7GT	♦-45VDC	♦225VDC	♦0V	♦-45VDC	♦45VDC ♦105VDC	♦0V	♦0V	♦11.3VAC	
V 22	6BG6G	¶290VDC	♦6.3VAC	¶11VDC	0V	¶-19VDC	¶0V	♦0V	¶290VDC	TOP CAP *
V 23	5V4G	0V	330VDC	0V	190VDC	0V	190VDC	0V	330VDC	
V 24	1B3GT	* DO NOT MEASURE ♦								
V 25	1B3GT	* DO NOT MEASURE								
V 26	16AP4	0V	10VDC	PIN 10 320VDC	PIN 11 122VDC	PIN 12 6.3VAC				

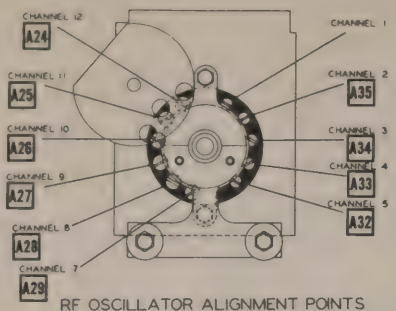
§ TAKEN WITH VACUUM TUBE VOLTMETER.
♦ MEASURED FROM PIN 6 OF V21.
¶ MEASURED FROM PIN 6 of V18.

RESISTANCE READINGS

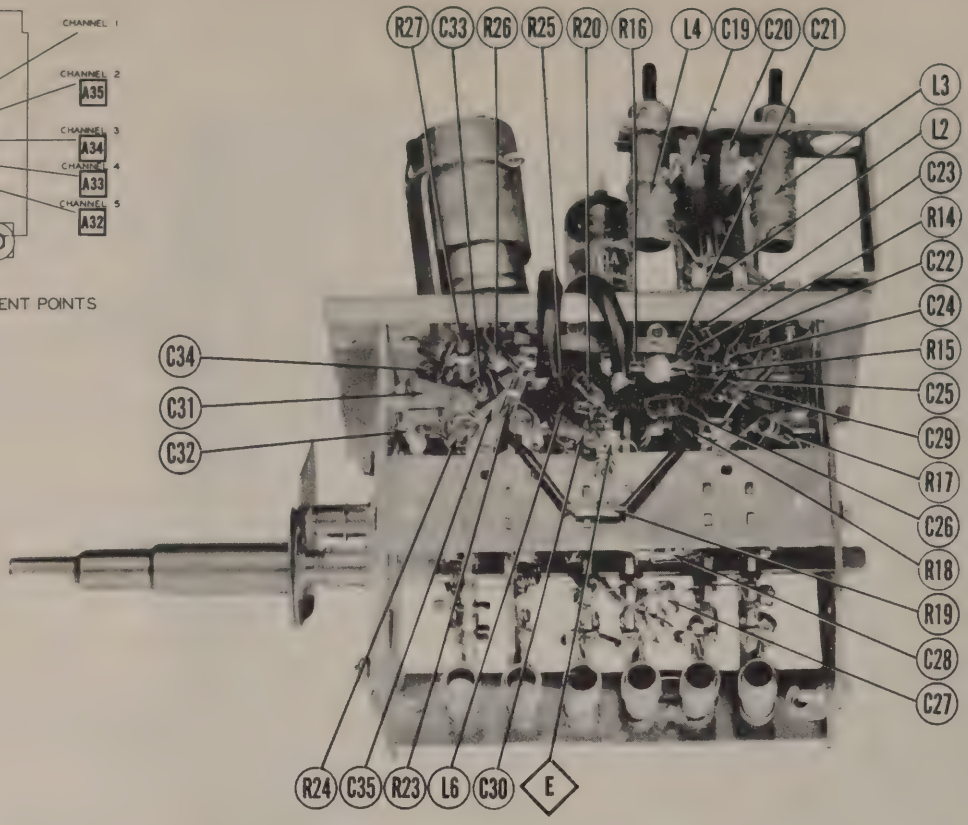
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†4KΩ	†4KΩ	.1Ω	0Ω	3.2Meg.	3.2Meg.	0Ω		
V 2	6J6	†1.6KΩ	†1.6KΩ	.1Ω	0Ω	1 Meg.	1 Meg.	0Ω		
V 3	6J6	†5KΩ	†5KΩ	.1Ω	0Ω	100KΩ	100KΩ	47Ω		
V 4	6AU6	3.2 Meg.	0Ω	0Ω	.1Ω	†1.7KΩ	†1.7KΩ	39Ω		
V 5	6AU6	3.2 Meg.	0Ω	0Ω	.1Ω	†1.7KΩ	†1.7KΩ	39Ω		
V 6	6AU6	3.2 Meg.	0Ω	0Ω	.1Ω	†5.6KΩ	†1.7KΩ	39Ω		
V 7	6AU6	.2Ω	0Ω	0Ω	.1Ω	†1.7KΩ	†1.7KΩ	180Ω		
V 8	6AL5	100KΩ	2.2KΩ	0Ω	.1Ω	.2Ω	0Ω	2.2 Meg.		
V 9	6AU6	7Ω	0Ω	0Ω	.1Ω	†4KΩ	†800Ω	0Ω		
V 10	6AQ5	1 Meg.	0Ω	.1Ω	0Ω	†3KΩ	†200Ω	1 Meg.		
V 11	12AU7	#100KΩ	0Ω	180KΩ	♦.1Ω	♦.1Ω	†200Ω	1.1 Meg.	13KΩ	♦0Ω
V 12	6AU6	4.5Ω	0Ω	0Ω	.1Ω	†1.7KΩ	†1.7KΩ	68Ω		
V 13	6AU6	100KΩ	0Ω	0Ω	.1Ω	†1.7KΩ	†8.5KΩ	0Ω		
V 14	6S8GT	100KΩ	0Ω	100KΩ	Inf.	200KΩ	†480KΩ	.1Ω	0Ω	TOP CAP 15 Meg.
V 15	6V6GT	0Ω	0Ω	†300Ω	†11KΩ	470KΩ	0Ω	.1Ω	350Ω	
V 16	12AU7	†11KΩ	180KΩ	0Ω	0Ω	0Ω	†19KΩ	1 Meg.	0Ω	.1Ω
V 17	6SN7GT	1 Meg.	†7KΩ	4.5KΩ	Inf.	†100KΩ	♦1000Ω	♦0Ω	♦.1Ω	
V 18	6SN7GT	¶1.5Meg.	†2.5Meg. †500KΩ	¶0Ω	¶1.5 Meg.	†100KΩ	¶0Ω	♦0Ω	♦.1Ω	
V 19	6K6GT	Inf.	♦.1Ω	†11KΩ	†11KΩ	¶4.7 Meg.	12KΩ	♦0Ω	¶5KΩ ¶270Ω	
V 20	6AL5	Inf.	Inf.	0Ω	.1Ω	♦150KΩ	♦0Ω	♦150KΩ		
V 21	6SN7GT	†150KΩ	†5KΩ	♦0Ω	†150KΩ	†350KΩ †110KΩ	♦0Ω	♦0Ω	♦.1Ω	
V 22	6BG6G	#15KΩ	♦.1Ω	¶100Ω	Inf.	¶330KΩ	¶24Ω	♦0Ω	#15KΩ	TOP CAP #90Ω
V 23	5V4G	Inf.	125KΩ	Inf.	†150Ω	Inf.	†150Ω	Inf.	125KΩ	
V 24	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #140Ω
V 25	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP Inf.
V 26	16AP4	0Ω	13KΩ	PIN 10 #3.3KΩ	PIN 11 10KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 4 OF M9.
# MEASURED FROM PIN 8 OF V23.
♦ MEASURED FROM PIN 6 OF V21.
¶ MEASURED FROM PIN 6 OF V18.

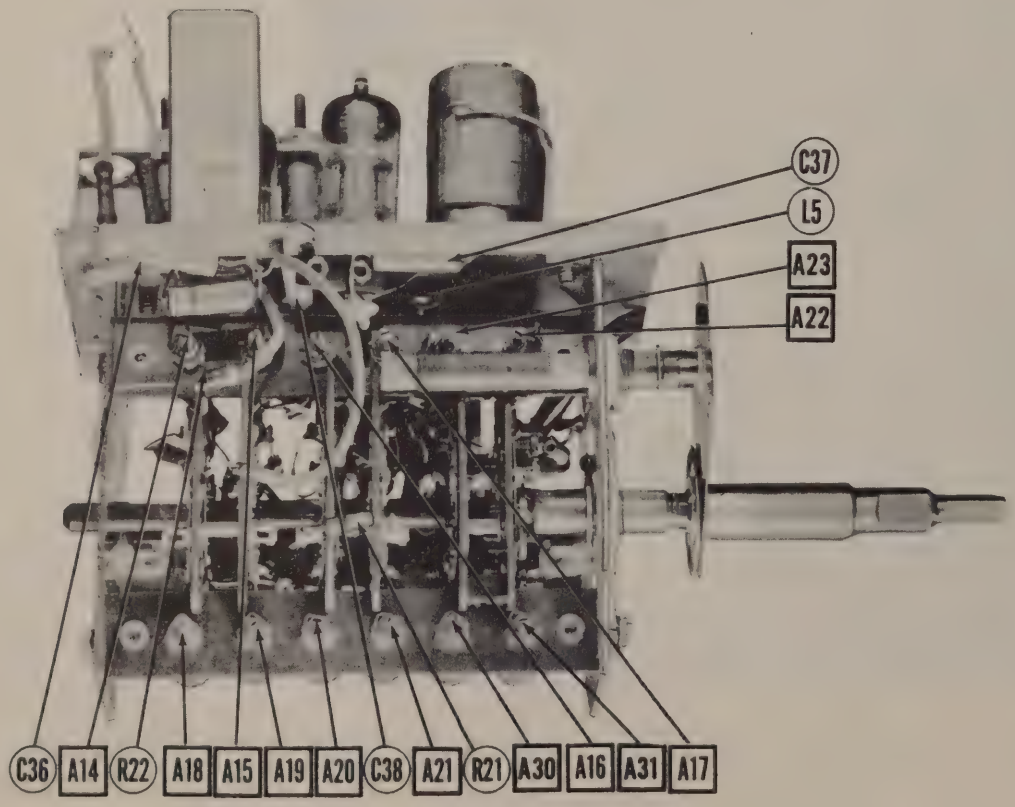
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



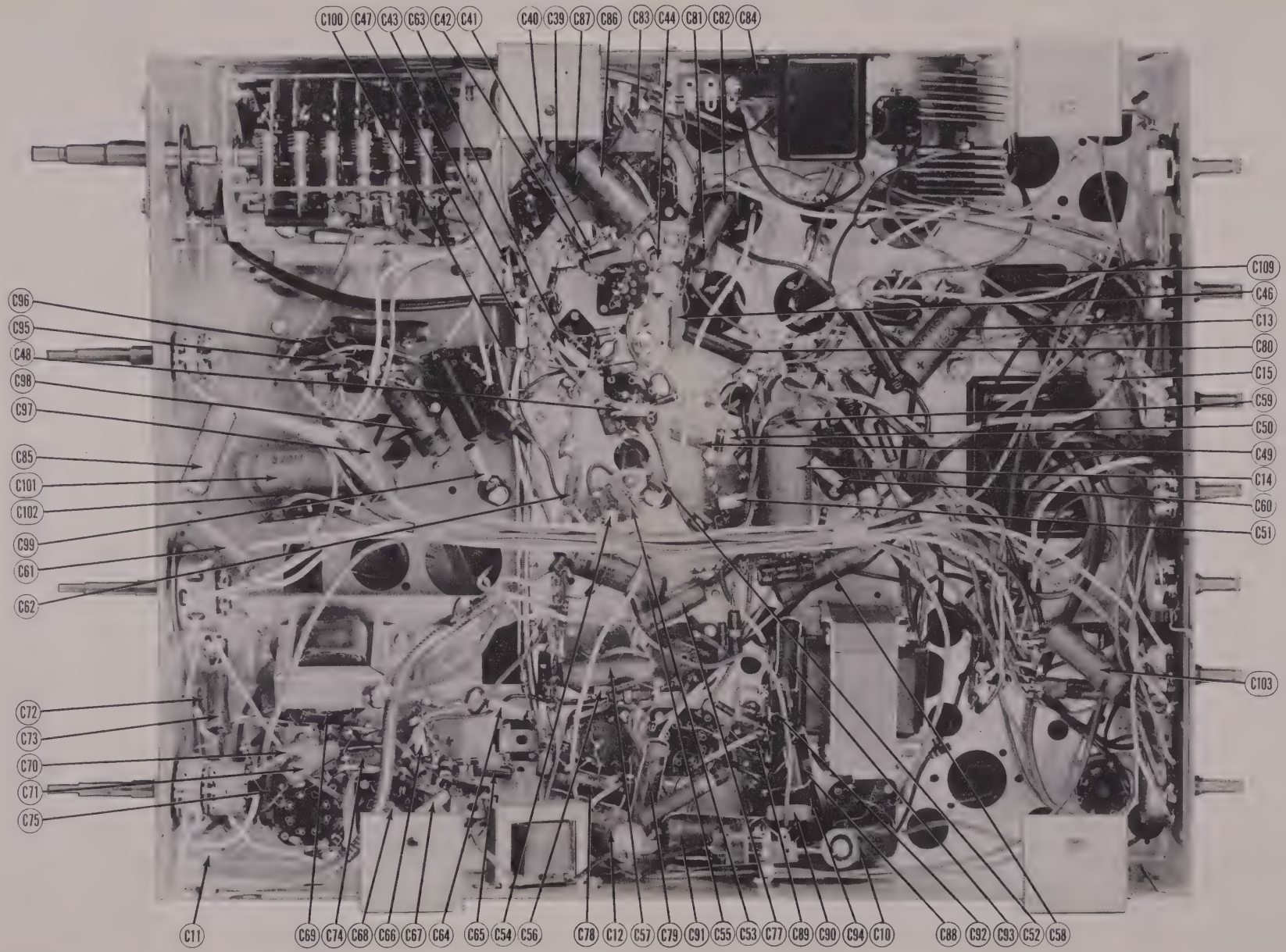
RF OSCILLATOR ALIGNMENT POINTS



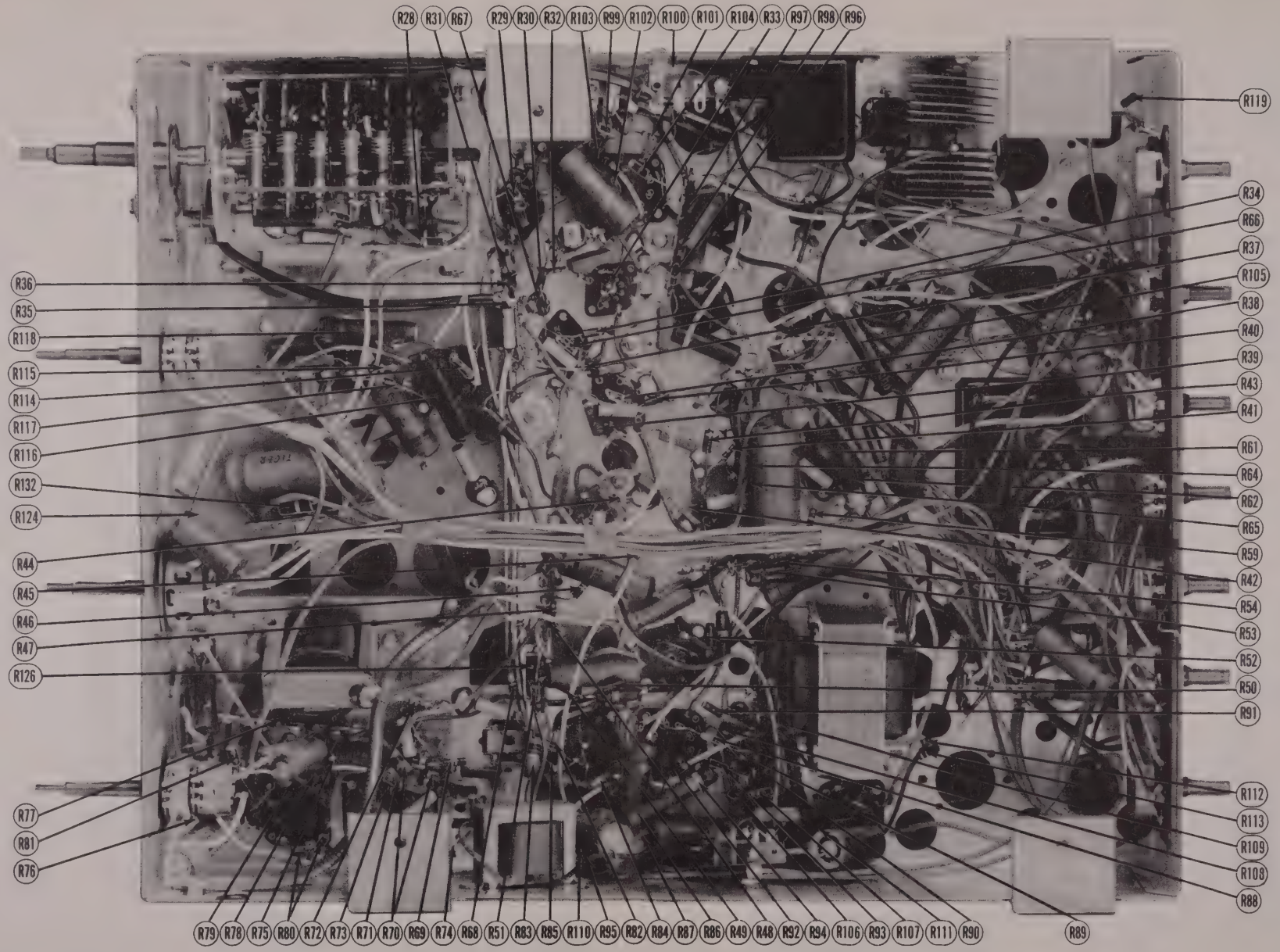
RF TUNER (#470233)-RIGHT SIDE



RF TUNER (#470233)-LEFT SIDE



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amp.	800536	6J6	7BF	Tuner 470233
B	RF Amp.	800535	6AG5	7BD	Tuner 470452
V2A	Mixer	800536	6J6	7BF	Tuner 470233
B	Converter	800536	6J6	7BF	Tuner 470452
V3	Oscillator	800536	6J6	7BF	Tuner 470233
V4	1st Video IF	800533	6AU6	7BK	
V5	2nd Video IF	800533	6AU6	7BK	
V6	3rd Video IF	800533	6AU6	7BK	
V7	4th Video IF	800533	6AU6	7BK	
V8	Video Det.-AGC Rectifier	800541	6AL5	6BT	
V9	Video Amp.	800533	6AU6	7BK	
V10A	Video Output	800031	6AQ5	7BZ	Chassis 120089B
B	Video Output	800031	6AQ5	7BZ	Chassis 120104B
V11A	Cathode Follower-DC Restorer	800026	12AU7	9A	Chassis 120089B
B	DC Restorer-Sync. Sep.	800026	12AU7	9A	Chassis 120104B
V12	Sound IF Amp.	800533	6AU6	7BK	
V13	Limiter	800533	6AU6	7BK	
V14	Disc.-AF Amp.	800015	6S8GT	8CB	
V15	Audio Output	800270	6V6GT	7AC	
V16	Sync. Amp.	800026	12AU7	9A	
V17	Sync. Phase Inv.-Hor. AFC	800380	6SN7GT	8BD	
V18	Vert. Osc. and Disch.	800380	6SN7GT	8BD	
V19	Vert. Output	800016	6K6GT	7S	
V20	Hor. Phase Det.	800541	6AL5	6BT	
V21	Hor. Osc. and Disch.	800380	6SN7GT	8BD	
V22	Hor. Output	800004	6BG6G	5BT	
V23A	Damper	800011	5V4G	5L	Chassis 120089B
B	Damper	800037	6W4GT	4CG	Chassis 120104B
V24	HV Rectifier	800450	1B3GT	3C	
V25	HV Rectifier	800450	1B3GT	3C	
V26	Picture Tube	810005	16AP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	120	150	925137	AFN24D			TVL-44	▲ Voltage Doubler Cap.
C2A	80	300	925139	AFN1616G	UP8830		TVL-14	▲ Filter
B	80	250						▲ Filter
C3A	80	250	925144	AFH1616G	UP8830		TVL-14	▲ Filter
B	80	250						▲ Filter
C4A	1000	15	925097	AF200200P	UP10BJ1059		TVL-13	■ Hor. Cent. Cont. Bypass
B	1000	15						▲ Vert. Cent. Cont. Bypass
C5	80	200	925145	AFH16G	UP8030		TVL-62	Filter
C6	80	150	925128	AFN16D	UP7AJ474		TVL-61	Voltage Doubler Cap.
C7	80	300	925143	AFN16G	UP8030		TVL-4	Filter
C8	80	300	925146	AFH16G	UP8030		TVL-4	Filter
C9	80	300	925146	AFH16G	UP8030		TVL-4	Filter
C10	8	250	925157	PRS350/8	BR825		UT-82	Filter
C11	8	250	925111	PRS350/8	BR825		UT-82	Decoupling
C12	8	250	925111	PRS350/8	BR825		UT-82	Decoupling
C13	8	250	925111	PRS350/8	BR825		UT-82	Vert. Output Plate Dec. †
C14	8	350	925114	PRS350/8	BR835A		UT-83	Decoupling
C15	10	50	925072	PRS50/10	BR105		TVA-14	Vert. Output Cath. Bypass
C16	1500		925006	1467-0015	1W5D15	GP2L-0015	1FM-215	RF Coupling
C17	1500		925006	1467-0015	1W5D15	GP2L-0015	1FM-215	RF Coupling
C18	.05	400	922101	P488-05	GT4S5		TM-15	Isolation
C19	10	500				NPOK-10		Fixed Trimmer
C20	10	500				NPOK-10		Fixed Trimmer
C21	1500					GP2L-0015		AGC Filter
C22	270					GP2K-270		RF Coupling
C23	270					GP2K-270		RF Coupling
C24	1.5					NPOK-1.5		Neutralizing
C25	1.5					NPOK-1.5		Neutralizing
C26	.68							RF Coupling
C27	4.7					NPOK-4.7		RF Coupling
C28	2.2							RF Coupling
C29	1500					GP2L-0015		RF Decoupling
C30	15					GP1K-15		Fixed Trimmer
C31	1500					GP2L-0015		Osc. Decoupling
C32	10					NPOK-10		Fixed Trimmer
C33	4.7					NPOK-4.7		Osc. Feedback
C34	4.7					NPOK-4.7		Osc. Feedback
C35	1500					GP2L-0015		Filament Bypass
C36	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	Mixer Decoupling *
C37	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	Filament Bypass *
C38	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	AGC Filter
C39	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	1st V. IF Decoupling
C40	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	1st V. IF Fil. Bypass
C41	75			1469-000075		N750L-75		Fixed Trimmer
C42	270	500	910015	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C43	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	AGC Filter
C44	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	2nd V. IF Decoupling
C45	75			1469-000075		N750L-75		Fixed Trimmer
C46	270	500	910015	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C47	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	AGC Filter
C48	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	3rd V. IF Decoupling
C49	270	500	910015	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C50	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	4th V. IF Cath. Bypass

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	4th V. IF Decoupling
C52	270	500	910015	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C53	30	500	910290	1468-00004	5W5Q3	GP1K-33	MS-43	IF Coupling
C54	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	AGC Filter
C55	.1	400	923084	P488-1	GT4P1		TM-1	AGC Filter
C56	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	RF Bypass
C57	.05	400	923073	P488-05	GT4S5		TM-15	Video Coupling
C58	.05	400	923073	P488-05	GT4S5		TM-15	Video Coupling
C59	.25	400	923066	P488-25	GT4P25		TC-2	Video Coupling
C60	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	Cath. Fol.-DC Rest. Fil. Byp.
C61	.1	400	923064	P488-1	GT4P1		TM-1	Pic. Tube Cath. Dec.
C62	10	500	910130	1468-00001	5W5Q1	GP1K-10	MS-41	S. IF Coupling
C63	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	1st S. IF Screen Bypass
C64	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	1st S. IF Plate Dec.
C65	68	500	910031	1468-000075	5W5Q7	GP1K-68	1FM-475	Limiter Grid Filter
C66	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	Limiter Screen Bypass
C67	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	Limiter Plate Decoupling
C68	100	500	910010	1468-0001	5W5T1	GP1K-100	1FM-31	RF Bypass
C69	.001	600	923079	P688-001	GT6D1	GP2L-001	TM-21	De-emphasis
C70	.01	400	923081	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C71	.01	400	923081	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C72	.01	400	923061	P488-01	GT4S1	GP2-335-01	TM-11	Tone Compensation
C73	.005	400	923078	P688-005	GT6D5	GP2M-005	TM-25	Vol. Cont. Isolation
C74	.05	400	923062	P488-05	GT4S5		TM-15	Audio Coupling
C75	.005	400	923078	P688-005	GT6D5	GP2M-005	TM-25	Output Plate Bypass
C76	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	Tone Compensation
C77	.01	400	923061	P488-01	GT4S1	GP2-335-01	TM-11	Sync. Coupling
C78	.05	400	923062	P488-05	GT4S5		TM-15	Sync. Coupling
C79	.05	400	923073	P488-05	GT4S5		TM-15	Sync. Coupling
C80	.01	600	923075	P688-01	GT6S1	GP2-335-01	TM-11	Vert. Sync. Coupling
C81	.005	400	923078	P688-005	GT6D5	GP2M-005	TM-25	Integrator Net.
C82	.005	400	923078	P688-005	GT6D5	GP2M-005	TM-25	Integrator Net.
C83	.003	600	923085	P688-003	GT6D3	GP2M-003	TM-23	Vert. Osc. Grid Cap.
C84	.25	400	923115	P488-25	GT4P25		TC-2	Vert. Osc. Plate Dec.
C85	.05	400	923062	P488-05	GT4S5		TM-15	Vert. Hold Cont. Isolation
C86	.05	600	923073	P688-05	GT6S5		TM-15	Vert. Discharge
C87	.05	600	923073	P688-05	GT6S5		TM-15	Vert. Sweep Coupling
C88	1000	500	910027	1467-001	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C89	1000	500	910027	1467-001	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C90	.05	400	923061	P488-05	GT4S5		TM-15	AFC Filter †
C91	.25	400	923066	P488-25	GT4P25		TC-2	AFC Feedback
C92	100	500	910010	1468-0001	5W5T1	GP1K-100	1FM-31	RF Bypass **
C93	005	600	923077	P688-005	GT6D5	GP2M-005	TM-25	Hor. Feedback
C94	780	500	910023	1468-00075	1W5T8	GP2K-750	MS-38	Hor. Osc. Grid Cap.
C95	470	500	910017	1468-0005	5W5T5	GP2K-470	1FM-35	Hor. Discharge
C96	.01	600	923075	P688-01	GT6S1	GP2-335-01	TM-11	Hor. Sweep Coupling
C97	.05	600	923073	P688-05	GT6S5		TM-15	Hor. Output Screen Bypass
C98	.1	400	923080	P488-1	GT4P1		TM-1	Hor. Output Cath. Bypass ‡
C99	1500		928006	1467-0015	1W5D15	GP2L-0015	1FM-215	Hor. Output Cath. Bypass
C100	.05	600	923062	P688-05	GT6S5		TM-15	Damper Filter
C101	.25	400	923066	P488-25	GT4P25		TC-2	Damper Filter
C102	.15	400	920400	P488-15				Damper Filter
C103	.035	600	923086	P688-033				Fixed Trimmer #
C104	.02	400	923114	P488-02	GT4S2		TM-12	Fixed Trimmer •
C105	.02	400	923114	P488-02	GT4S2		TM-12	Hor. Feedback •
C106	500	10000	923003			410-500		Voltage Doubler Cap.
C107	500	10000	923003			410-500		HV Filter
C108	500	10000	923003			410-500		HV Filter
C109	.05	400	922101	P488-05	GT4S5		TM-15	Line Filter

** Used only in chassis 120089-B.
* Used only with tuning unit #470233.
† C13 is taken off ground and connected to B- in model 120104-BJ. The rating also changes to 8MFD 450 Volts. Part No. 925073
‡ Some models use .01MFD in this application.
§ Some models use .25MFD in this application.
# Not used on all models.
• Used only on chassis 120104B and 120104BJ.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	2200Ω	½	390071		390071	Contrast control
B	1 Meg.	½				Volume control and switch, tapped at 250KΩ
R2A	600Ω	4	390085			Focus control, Wire Wound
B	100KΩ	½				Brightness control
R3A	1 Meg.	½		B11-137 *		Vert. hold control, front
B	250KΩ	½	390036	B11-123 *	390036	Horiz. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R4A	1 Meg	½		B11-137 *		Tone control, front See Note 1
B	1 Meg.	½	390095	B13-137X *		Volume control, tapped at 250KΩ, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
D	Switch			76-1 *		Attach per instructions in "Concentrikit".
R5A	100KΩ	½	390096			Brightness control See Note 1
B	2200Ω	½				Contrast control
R6	500Ω	½	390073	QU-103	M-5-S	Horiz. damping control See Note 2
R7	250KΩ	½	390072	QU-130	M-55-S	Horiz. drive control
R8	5000Ω	2	390039	W-5000	43-5000	Vert. linearity control, Wire Wound
R9	2 Meg.	½	390038	QU-139	M-83-S	Height control
R10A	20KΩ	½	390035	QU-119	M-36-S	Horiz. peaking control
B	20KΩ	½	390094	QU-119	M-36-S	Horiz. peaking control, See Note 1
R11	30Ω	2	390054	W-30	43-30	Horiz. centering control, Wire Wound
R12	30Ω	2	390033	W-30X10	43-30 C. T.	Vert. centering control, Wire Wound, tapped at 15Ω
R13	600Ω	4	390097			Focus control, Wire Wound, See Note 1

* Additional parts to be used with "Concentrikit".
Note 1. Used only in chassis 120104B.
Note 2. Some models use 300Ω control, part #390387. This control is not used in chassis 120104B.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R14	150Ω	½			RF Grid
R15	150Ω	½			RF Grid
R16	1000Ω 20%	½		BTS-1000	AGC Filter Network
R17	4700Ω 20%	½			RF Plate
R18	470Ω 20%	½			RF Plate
R19	1000Ω 20%	½		BTS-1000	RF Decoupling
R20	1 Meg. 20%	½			Mixer Grid
R21	10KΩ	½		BTS-10K	Mixer Grid Shunt
R22	1000Ω	½	340492	BTS-1000	Mixer Decoupling
R23	150Ω	½			Decoupling
R24	4700Ω 20%	½		BTS-4700	Osc. Plate
R25	47Ω 20%	½			Osc. Cathode
R26	100KΩ 20%	½		BTS-100K	Osc. Grid
R27	100KΩ 20%	½		BTS-100K	Osc. Grid
R28	3900Ω 5%	1	330632	BTA-3900-5%	1st Video IF Transformer Shunt
R29	39Ω	½	340152		1st Video IF Cathode
R30	1000Ω	½	340492	BTS-1000	1st Video IF Decoupling
R31	1000Ω	½	340492	BTS-1000	AGC Network
R32	15KΩ 5%	½	330772	BTS-15K-5%	2nd Video IF Grid
R33	39Ω	½	340152		2nd Video IF Cathode
R34	1000Ω	½	340492	BTS-1000	2nd Video IF Decoupling
R35	1000Ω	½	340492	BTS-1000	AGC Network
R36	1000Ω	½	340492	BTS-1000	AGC Network
R37	6800Ω 5%	½	33026	BTS-6800-5%	3rd Video IF Grid
R38	39Ω	½	340152		3rd Video IF Cathode
R39	3900Ω 5%	1	360632	BTA-3900-5%	3rd Video IF Plate
R40	1000Ω	½	340492	BTS-1000	3rd Video IF Decoupling
R41	180Ω	½	340312		4th Video IF Cathode
R42	10KΩ	½	340732	BTS-10K	4th Video IF Plate Coil Shunt
R43	1000Ω	½	340492	BTS-1000	4th Video IF Decoupling
R44	2.2 Meg.	½	341292	BTS-2.2 Meg.	AGC Rect. Diode Load
R45	1 Meg.	½	341212	BTS-1 Meg.	AGC Network
R46	100KΩ	½	340972	BTS-100K	Delayed AGC Network
R47	120KΩ	½	340992	BTS-120K	Delayed AGC Network
R48	2200Ω	½	340572	BTS-2200	Voltage Divider
R49	3300Ω 5%	1	360612	BTA-3300-5%	1st Video Amp. Plate
R50	10KΩ 20%	½	350732	BTS-10K	Peaking Coil Shunt See Note 4
R51	1 Meg.	½	341212	BTS-1 Meg.	2nd Video Amp. Grid
R52	10KΩ 20%	½	350732	BTS-10K	Peaking Coil Shunt See Note 4
R53	3000Ω	5	394045	AB-3000	2nd Video Amp. Plate-Wire Wound See Note 3
R54	3300Ω	½	340612	BTS-3300	Acc. Anode Decoupling See Note 4
R55	10KΩ	½	340732	BTS-10K	Bias Network See Note 5
R56	82KΩ	½	340932	BTS-82K	Voltage Divider See Note 5
R57	3300Ω	½	340612	BTS-3300	Isolation See Note 5
R58	1 Meg.	½	341212	BTS-1 Meg.	Sync. Sep. Grid See Note 5
R59	100KΩ	½	340972	BTS-100K	Voltage Divider
R60	560KΩ	½	341152	BTS-560K	Voltage Divider See Note 5
R61	1 Meg.	½	341212	BTS-1 Meg.	Cathode Follower Grid
R62	10KΩ	3	397049	AB-10, 000	Cathode Follower Load
R63	22KΩ	½	340812	BTS-22K	Voltage Divider See Note 5
R64	22KΩ	½	340812	BTS-22K	DC Rest. Diode Load
R65	180KΩ	½	341092	BTS-180K	DC Rest. Diode Load
R66	68Ω	½	340212		Sound IF Cathode
R67	1000Ω	½	340492	BTS-1000	Sound IF Screen Decoupling
R68	1000Ω	½	340492	BTS-1000	Sound IF Plate Decoupling
R69	100KΩ	½	340972	BTS-100K	Limiter Grid
R70	10KΩ	2	397014		Limiter Screen See Note 6
R71	1000Ω	½	340492	BTS-1000	Limiter Plate Decoupling
R72	4700Ω	½	340652	BTS-4700	Voltage Divider
R73	100KΩ	½	340972	BTS-100K	Disc. Diode Load
R74	100KΩ	½	340972	BTS-100K	Disc. Diode Load
R75	68KΩ	½	340932	BTS-68K	De-emphasis
R76	47KΩ	½	340892	BTS-47K	Tone Compensation
R77	15 Meg.	½	351492	BTS-15 Meg.	AF Grid
R78	470KΩ	½	341132	BTS-470K	AF Plate
R79	470KΩ	½	341132	BTS-470K	Output Grid See Note 4
R80	330Ω	1	370372	BTA-330	Output Cathode See Note 6 and 7
R81	10KΩ	½	340732	BTS-10K	Decoupling
R82	1 Meg.	½	341212	BTS-1 Meg.	Sync. Amp. Grid
R83	22KΩ	1	370812	BTA-22K	Sync. Amp. Plate
R84	180KΩ	½	341032	BTS-180K	Sync. Amp. Grid
R85	47KΩ	½	340892	BTS-47K	Voltage Divider See Note 4
R86	10KΩ	1	370732	BTA-10K	Sync. Amp. Plate
R87	1000Ω	½	340492	BTS-1000	Sync. Amp. Plate
R88	1 Meg.	½	341212	BTS-1 Meg.	Sync. Phase Inv. Grid
R89	1000Ω	½	340492	BTS-1000	Sync. Phase Inv. Cathode
R90	150Ω	½	340292	BW-½-150	Sync. Phase Inv. Cathode
R91	4700Ω 5%	½	330652	BTS-4700-5%	Sync. Phase Inv. Plate
R92	2200Ω	½	330572	BTS-2200	Sync. Phase Inv. Plate
R93	1000Ω	½	340492	BTS-1000	Horiz. AFC Cathode
R94	100KΩ 5%	2	397029	BT-2-100K-5%	Horiz. AFC Plate
R95	47KΩ	½	340892	BTS-47K	Phase Shifter
R96	22KΩ	½	340812	BTS-22K	Voltage Divider
R97	22KΩ	½	340812	BTS-22K	Integrator
R98	4700Ω	½	340652	BTS-4700	Integrator
R99	1.5 Meg. 5%	½	331252	BTS-1.5 Meg.-5%	Vert. Osc. Grid
R100	100KΩ	1	370972	BTA-100K	Vert. Osc. Plate Decoupling
R101	470KΩ	½	341132	BTS-470K	Vert. Osc. Plate
R102	680Ω	½	340692	BTS-6800	Vert. Peaking
R103	4.7 Meg.	½	341372	BTS-4.7 Meg.	Vert. Output Grid
R104	270Ω	½	340352	BW-½-270	Vert. Output Cathode
R105	10KΩ	3	397043	AB-10, 000	Vert. Output Decoupling
R106	220KΩ	½	341052	BTS-220K	Horiz. Phase Det. Load
R107	220KΩ	½	341052	BTS-220K	Horiz. Phase Det. Load
R108	100KΩ 5%	½	330972	BTS-100K-5%	Horiz. Phase Det. Load
R109	100KΩ 5%	½	330972	BTS-100K-5%	Horiz. Phase Det. Load
R110	4700Ω	1	370652	BTA-4700	Horiz. Osc. Plate Decoupling
R111	47KΩ	½	340892	BTS-47K	Horiz. Osc. Grid
R112	220KΩ	½	341052	BTS-220K	Horiz. Osc. Plate See Note 8
R113	220KΩ	½	341052	BTS-220K	Horiz. Osc. Plate See Note 9
R114	82Ω	½			Parasitic Supp. See Note 10

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	IRC PART No.	IDENTIFICATION CODES
R115	100KΩ 5%	½	330972	BTS-100K-5%	Horiz. Output Grid See Note 11
R116	100Ω	2	397027	BW-2-100	Horiz. Output Cathode
R117	82Ω	½			Parasitic Supp. See Note 10
R118	14,500Ω 5%	5	394093		Horiz. Output Screen, Wire Wound, See Note 12
R119	270Ω	½	340352	BW-½-270	Horiz. Damping control Shunt, See Note 4
R120	3.9Ω	1	397042		HV Rect. Filament, Wire Wound, See Note 13
R121	3.9Ω	1	397042		HV Rect. Filament, Wire Wound, See Note 13
R122	2 Meg.15%	2	397025		HV Rect. Load
R123	2 Meg. 15%	1	397045		HV Filter
R124	4700Ω	½	340652	BTS-4700	Voltage Divider S ee Note 14
R125A	3100Ω	7	394043		Bias Network, Wire Wound See Note 15
B	1550Ω	7			Bias Network, Wire Wound
R126	180Ω	1	370312	BW-1-180	Voltage Divider, See Note 4
R127A	330Ω	3	394035	AB-350	Focus Coil Shunt, Wire Wound, See Note 16
B	600Ω	6		AB-600	Filter, Wire Wound, See Note 16
R128	1000Ω	2	397060	BT-2-1000	Focus Coil Shunt, See Note 17 and 4
R129	470KΩ	½	341132	BTS-470K	Isolation, See Note 5
R130	470KΩ	1	371132	BTA-470K	Feedback
R131	470KΩ	1	371132	BTA-470K	Feedback
R132	18Ω	1		BW-1-18	Damper Filter See Note 4 and 18

Note 3. Chassis 120104B uses 2,000Ω, 5 watt resistor in this application.
Note 4. Used in chassis 120089B only.
Note 5. Used in chassis 120104B only.
Note 6. Some models use two resistors in series, to obtain required resistance and wattage.
Note 7. Some models use 47Ω resistor in this application.
Note 8. Chassis 120104B uses 180KΩ resistor in this application.
Note 9. Not used in all models.
Note 10. Some models use 100Ω resistor in this application.
Note 11. Some models use 330KΩ resistor in this application.
Note 12. Chassis 120104B uses 18KΩ, 5 watt resistor in this application.
Note 13. Chassis 120104B uses 4.7Ω, 1 watt resistor in this application.
Note 14. Chassis 120104B uses 100KΩ resistor in this application.
Note 15. This section not used on chassis 120104B.
Note 16. Chassis 120104B uses a 350Ω, 3 watt, and a 600Ω, 6 watt, two section resistor, part #39071, in this application.
Note 17. Some models use two resistor in parallel to obtain required resistance and wattage.
Note 18. Some model use 22Ω, 1 watt resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at .63A	5VAC at 2A	6.3VAC at 3.5A	6.3VAC at 4.4A	738016			

TRANSFORMER (SWEEP CIRCUITS)

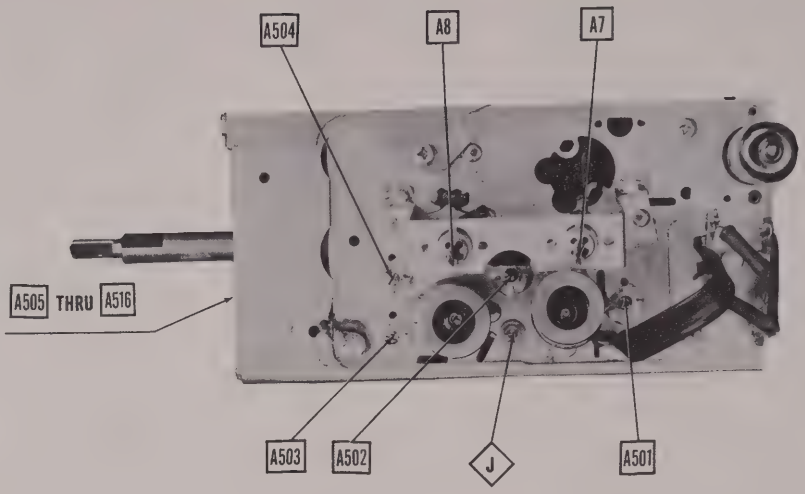
ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	1.2Ω	3Ω	738008	A-8110	A-3002		Hor. Block Osc. Trans.
T3	150Ω	1400Ω	738004	A-8121	A-4000	TBO-3	Vert. Block Osc. Trans.
T4	120Ω Tap at 75Ω	SEC. 1 7.1Ω Tap. at .45Ω SEC. 2 & 3 0Ω	738014 or 738024	A-8119		TFB-4	Hor. Output Trans.
T5	580Ω	7.1Ω	738010 or 738011	A-8115	A-3035	TSO-1	Vert. Output Trans.
T6A	14Ω		708130	DY-1			Hor. Deflection Coil
B	63Ω						Vert. Deflection Coil
T7	465Ω		708023				Focus Coil

TRANSFORMER (AUDIO OUTPUT)

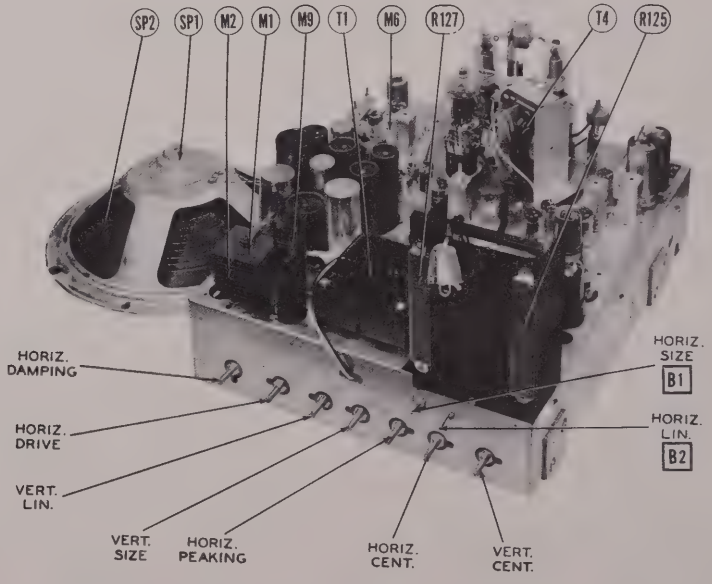
ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T8	5KΩ	4Ω	320Ω	.8Ω	734018	A-3849	A-2930 ④	RO-9 ④	④ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA EMERSON PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	PM	4Ω	180050	ST-101 ③ MOD. P12-T	12A31	③ Replace output transformer to match 6-8Ω voice coil.
	CONE DIA.	V. C. DIA.				
SP2	11 7/8"	1"				



RF TUNER (#470452)



CHASSIS-TOP VIEW

HORIZONTAL WIDTH AND LINEARITY ADJUSTMENTS

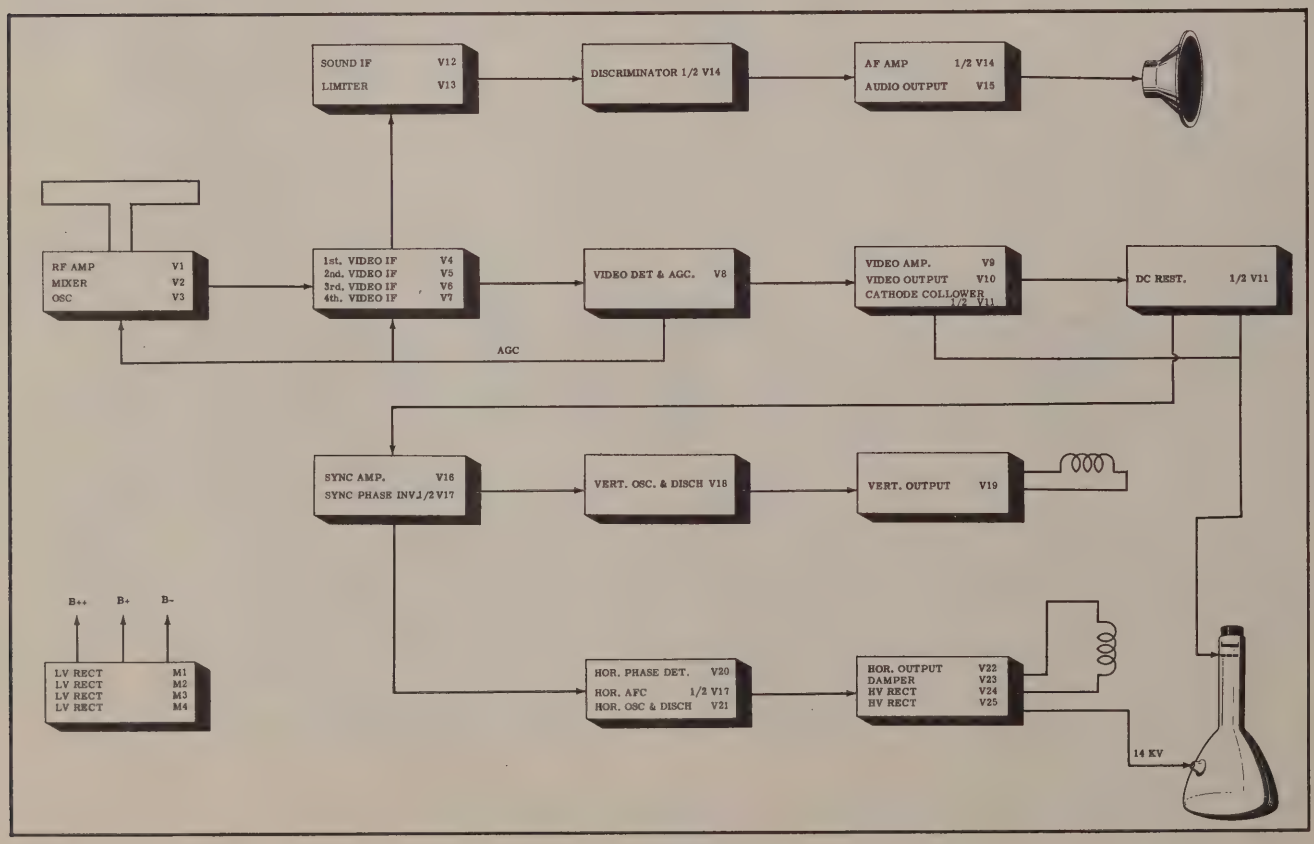
Turn the set on and tune in a test pattern from a local TV station. Adjust the horizontal and vertical hold controls to synchronize the picture.

Adjust the horizontal size slug (B1) and the horizontal drive control until the picture fills the mask horizontally. In some models there is an additional width adjustment, a switch, which is used when low line voltage results in insufficient width. Note that when this switch is in the large position, the horizontal size coil is removed from the circuit.

Adjust the peaking control, horizontal linearity slug (B2), and the horizontal damping control alternately until the picture is linear from left to right. (Note: Some models do not have the horizontal damping control)

DISASSEMBLY INSTRUCTIONS

1. Remove the four push-on type control knobs.
2. Remove fifteen screws holding the two rear covers. Remove covers.
3. Remove the speaker plug from the TV chassis.
4. Remove twol/4" hex head bolts holding power interlock.
5. Disconnect plug from cable leading to picture tube yoke.
6. Remove two philips head screws holding antenna terminal strip to cabinet.
7. Remove cabinet panel lamp socket.
8. Remove picture tube base socket and beam bender.
9. Remove six phillips head screws holding picture tube front panel. Remove panel.
10. Remove picture tube high voltage clip. Remove picture tube.
11. Remove 1/4" hex head bolt holding high voltage lead to insulator. Remove the high voltage lead.
12. Free all cables from clamps.
13. Remove four 7/16" hex head bolts holding chassis. Remove chassis. (Support chassis to prevent falling)
14. Remove four 5/16" hex nuts holding speaker. Remove speaker.



BLOCK DIAGRAM

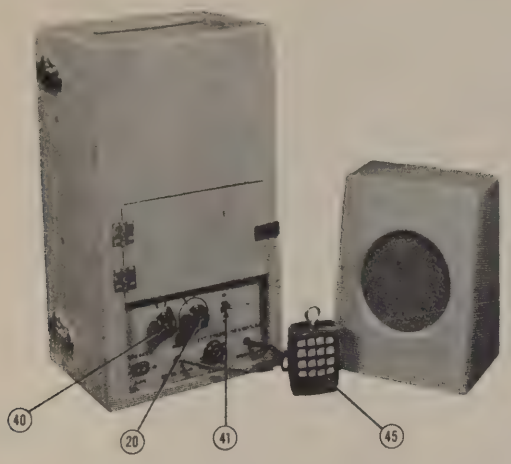


FIGURE 1

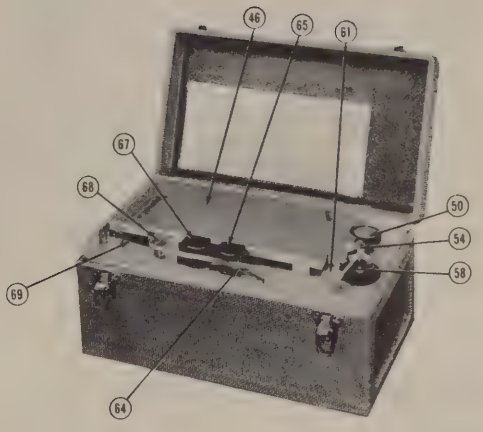


FIGURE 2

GENERAL INFORMATION

The AudiAd is a magnetic tape record-playback machine. It is designed to deliver an audible message from 5 seconds to 1 minute in duration, shut off automatically, and be in position to replay immediately without having to be rewound, reset, or rethreaded.

The AudiAd operates on 115-volt, 50-60 cycle AC only, and requires a power of approximately 50 watts.

Manufactured by: **MAGNECORD, INC.**
304 West 63rd Street • Chicago 21, Illinois

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MAGNECORD
AUDIAD AD-1R

MAGNECORD
AUDIAD AD-1R

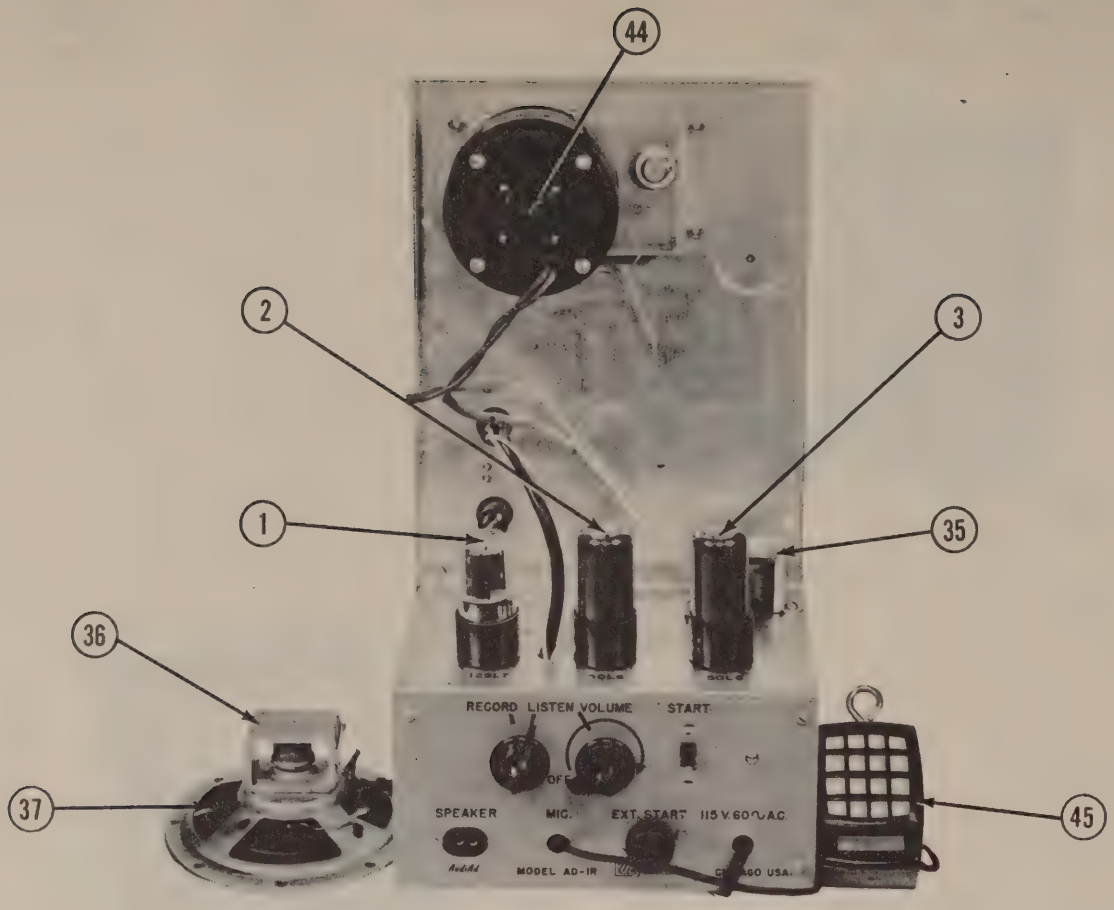

FIGURE 3

OPERATING INSTRUCTIONS

1—Threading of Tape:

(a) Open the cover of the AudiAd wide enough to permit access to the front panel (shown in Figure 2).

(b) Take tape coming out from the side of the magazine (making sure the black side of the tape is facing the magazine at all times), pull the automatic stop spring (69) outward and place the tape between the spring and the guide shoe (68). Release the spring, allowing it to bear against the tape.

(c) Pull out slightly on the head pressure spring (64) and thread the tape past the two heads (67 and 65). The pressure spring (64) holds the tape against the head.

(d) Thread the tape around the guide shoe (61).

(e) Push the pressure roller (50) away from the driving capstan (54) and place the tape between the roller and capstan. Release the roller. The tape is now firmly held in place. Allow the loose tape to fall into the magazine.

2—Speaker:

The speaker is separate from the unit and must be connected before placing the unit into operation. Plug the speaker connector into the receptacle on the control panel labeled "Speaker."

3—Record:

(a) Set the "Record-Listen" switch (40) to the "Record" position.

(b) Turn the "Volume Control" knob to the line that crosses the circle. This line is an approximate indication of the proper recording level.

(c) Pick up the attached microphone; best results are obtained by holding the microphone approximately 8 to 10 inches from the mouth.

(d) Set the tape in motion by pressing down on the "Start" motor switch (41); then talk into the microphone in a natural voice.

NOTE: Do not hold microphone next to the mouth and shout.

A recording of approximately one minute can be made at which time the mechanism will shut off automatically.

4—Playback:

A recording may be played back immediately by turning the "Record-Listen" control to "Listen," and by pushing down on the motor "Start" switch and releasing. The length of tape will play back the recording and will shut off automatically at the end. This message may be played back hundreds of times without any loss of quality or increased background noise. Volume of playback may be adjusted by turning the Volume Control.

5—Erase:

A recording may be erased any time by turning the "Record-Listen" control to the Record position and the Volume control to the lowest position without turning the machine off; however, a new recording may be made by following the instructions on "Record-3," at which time the old recording is automatically erased by the erase head (67).

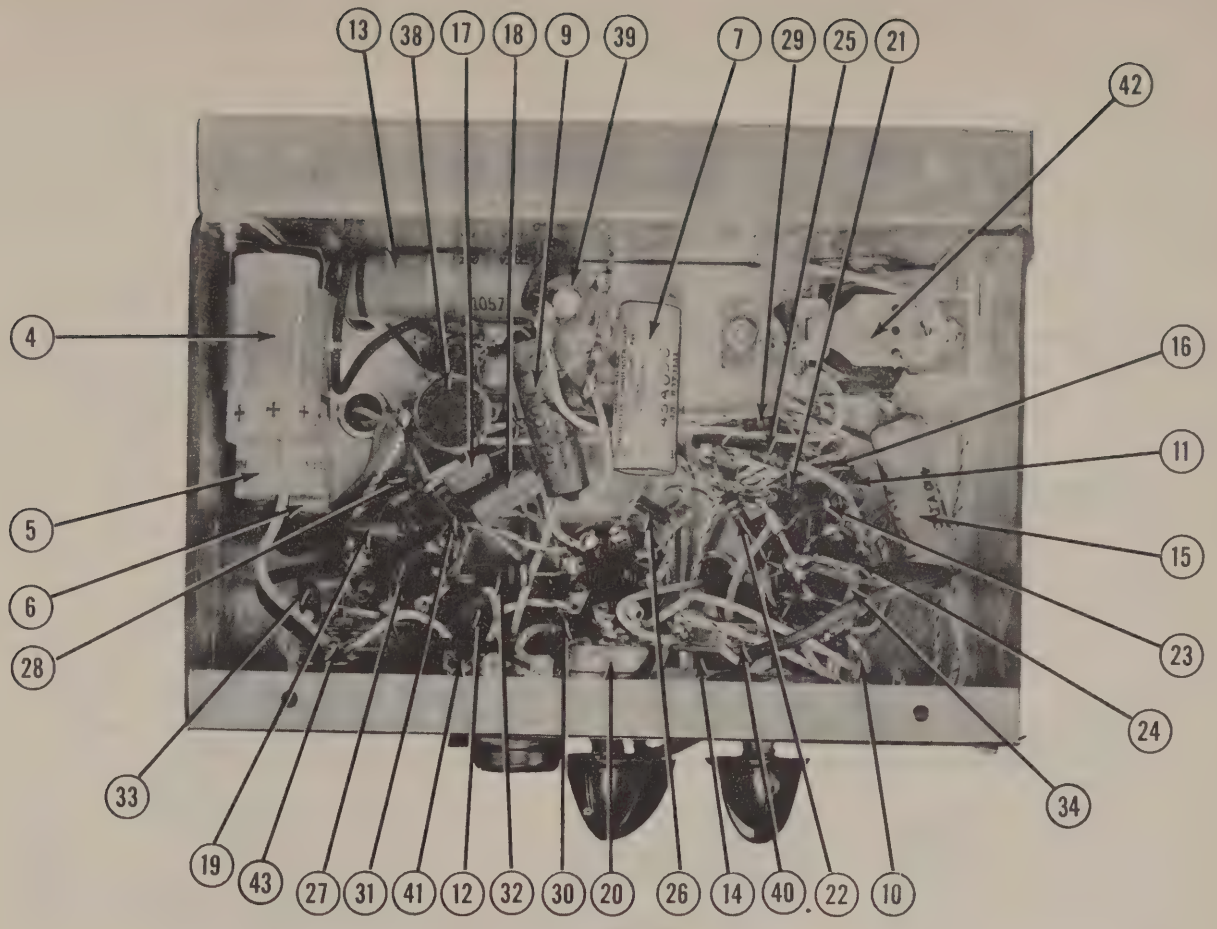

FIGURE 4

6—Automatic Stop:

The Automatic Stop is accomplished by punching a hole approximately ¼" long in the center of the tape. Several short messages may be made and stopped automatically after each message by this method. After the AudiAd stops automatically, it may be started again by pressing the "Start" switch. The automatic stop is actuated by the stop spring (69) when the spring drops into the hole in the top. This allows the spring to touch the metal contact in the tape guide shoe (68), automatically stopping the unit.

7—Repair of Tape:

In case the tape is broken accidentally, a splice may be made with Scotch tape. Do not use medical adhesive tape as the adhesive material is not suited for this purpose. The Scotch tape should be applied to the reverse, or uncoated, side of the recording tape. The edges of the splice should be trimmed with a small pair of scissors, or a knife, to bring the width of the splice to that of the rest of the recording tape so it will pass through the heads without interference.

TROUBLES AND ADJUSTMENTS

1—Automatic Stop Spring:

The automatic stop spring (69) provides the mechanical drag to the tape and the electrical contact through the tape for automatic stopping.

(a) Insufficient spring tension may cause incomplete erasing due to the lack of drag to the tape, and may cause the tape to run out from between the pressure roller (50) and capstan (54).

(b) Too great a spring tension may prevent the tape from being pulled by the capstan and may cause excessive wear on the tape.

The stop spring (69) may be adjusted by loosening the screw in spring bracket and pivoting the bracket until the proper tension is reached. Tighten the screw.

2—Head-Pressure Spring:

The head-pressure spring (64) holds the tape firmly against the center of the "Record-Playback" head.

(a) Insufficient tension of this spring may cause poor or no recording at all, or poor or no playback signal.

(b) Too great a tension may prevent the tape from being pulled by the capstan, or may cause excessive wear on the tape and head.

This pressure spring may be adjusted by loosening the screw in the bracket and rotating the bracket until the proper tension is reached. Tighten the spring.

3—Idler Wheel:

The idler wheel (58) serves to transmit the power from the motor to the capstan. The idler wheel should run freely on its shafts and the rubber tire should be kept free from oil or grease.

4—Pressure Roller:

The pressure roller (50) serves to grip the tape against the capstan and should run freely in its shaft. The pressure arm (52) should also work freely on its pivot, and the spring (53) should be properly connected to maintain proper operation. The rubber tire should be kept free from oil and grease.

NOTE: If oil or grease should come in contact with any of the driving surfaces of mechanism, it may cause slipping of the drive system. Clean with carbon tetrachloride.

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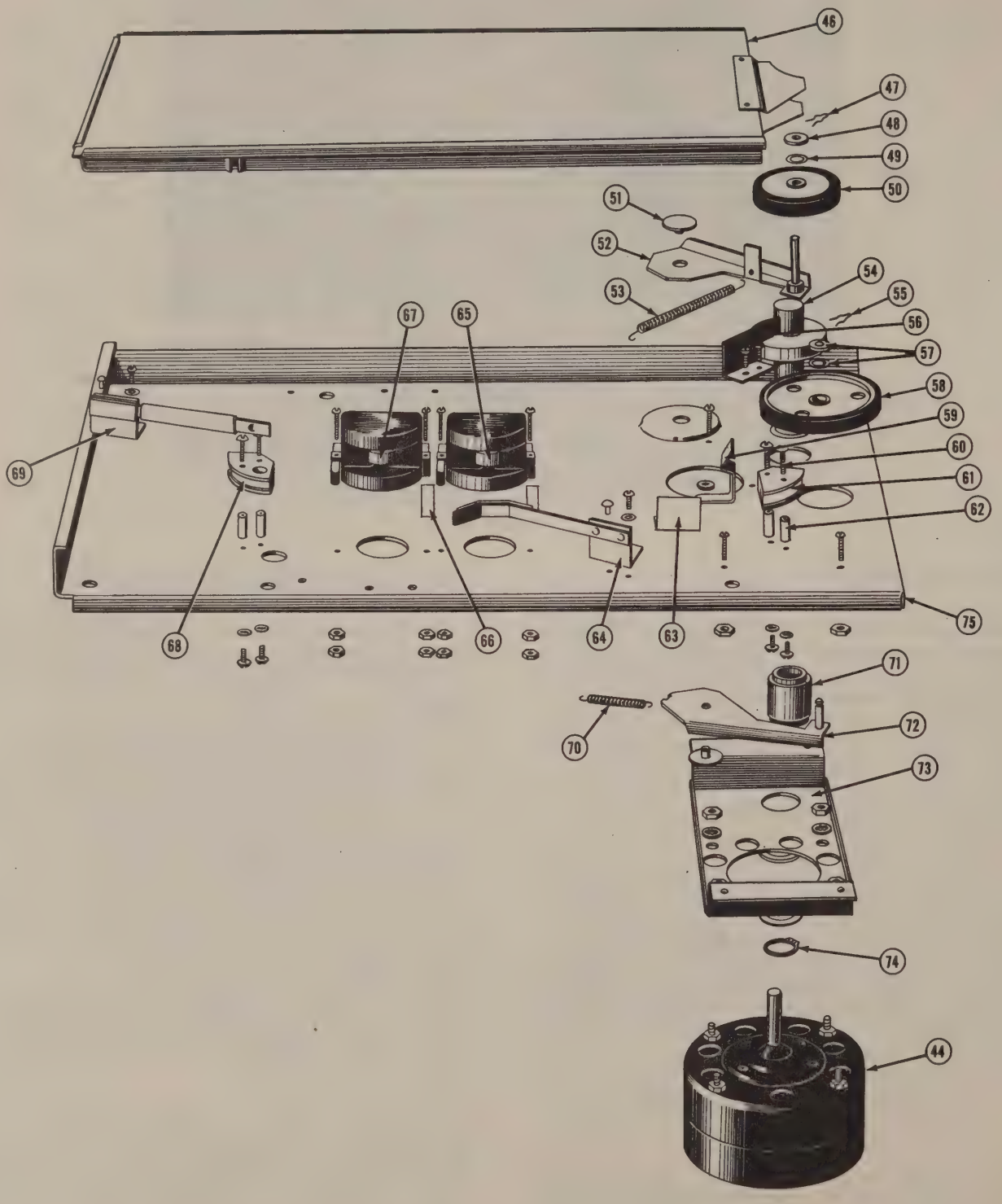

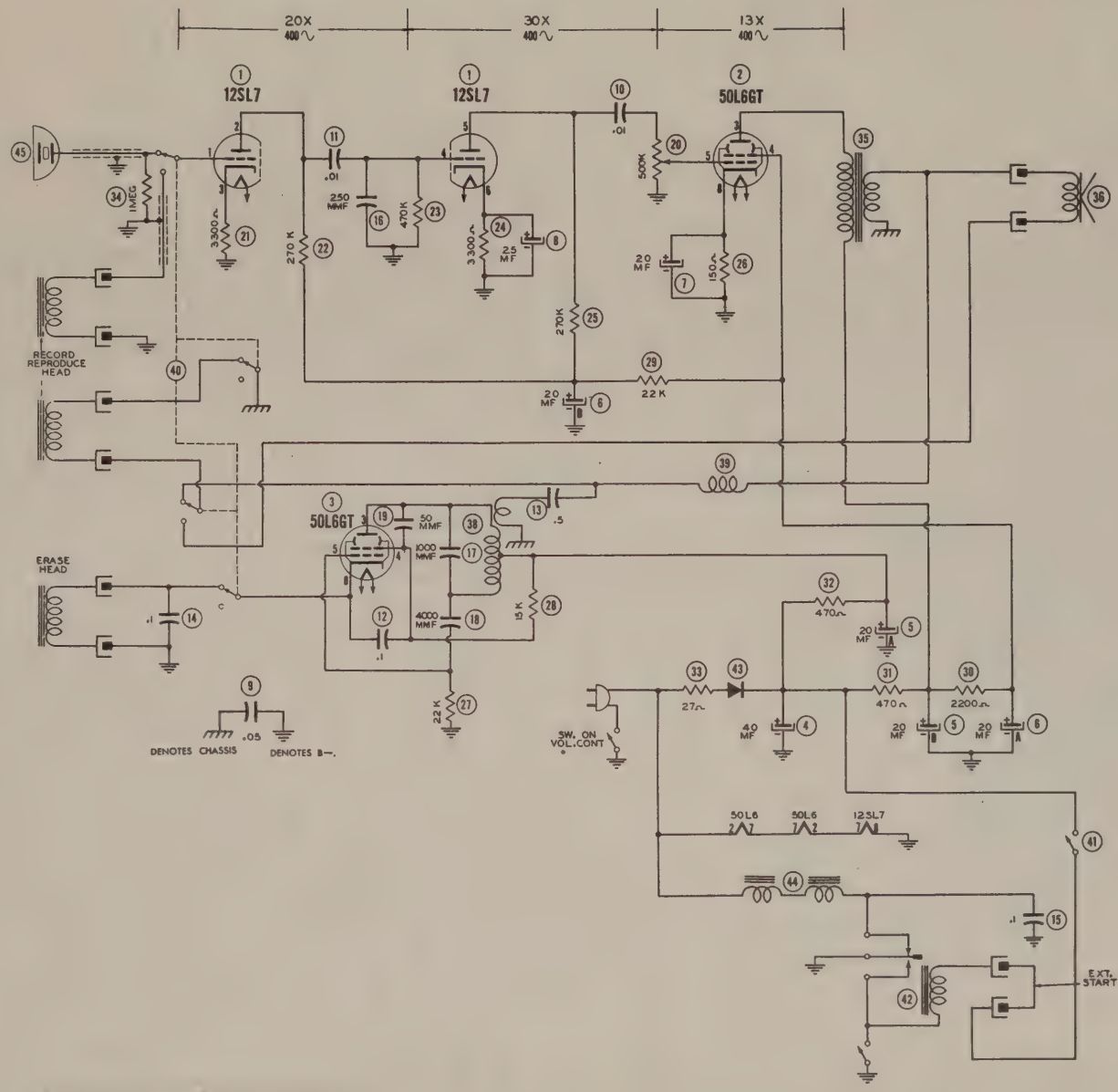

TAKEN IN RECORD POSITION.

①	Pin No.	12SL7GT Volt.	Res.
	1	-.1VDC	1 Meg.
	2	40VDC	310KΩ
	3	.6VDC	3.3KΩ
	4	-.1VDC	470KΩ
	5	40VDC	310KΩ
	6	.6VDC	3.3KΩ
	7	12VAC	13Ω
	8	0V.	0Ω

②	Pin No.	50L6GT Volt.	Res.
	1	0V.	0Ω
	2	12VAC	13Ω
	3	105VDC	20KΩ
	4	105VDC	22KΩ
	5	0V.	500KΩ
	6	115VDC	20KΩ
	7	65VAC	40Ω
	8	7.4VDC	150Ω

③	Pin No.	50L6GT Volt.	Res.
	1	0V.	INF.
	2	117VAC	40Ω
	3	120VDC	20KΩ
	4	80VDC	35KΩ
	5	-12.5VDC	22KΩ
	6	130VDC	22KΩ
	7	65VAC	40Ω
	8	4.6VDC	160Ω

STAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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MAGNECORD
AUDIAD AD-1R

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
		ELECTRICAL
1	2044-36	Tube, 12SL7GT
2	2044-37	Tube, 50L6GT
3	2044-37	Tube, 50L6GT
4	2044-27	Capacitor, filter 40 Mfd., 150 V.
5A,B	2044-26	Capacitor, filter 20-20 Mfd., 150 V.
6A,B	2044-26	Capacitor, filter, decoupling 20-20 Mfd., 150 V.
7		Capacitor, cathode bypass 20 Mfd., 25 V.
8	2044-28	Capacitor, cathode bypass 25 Mfd., 25 V.
9	2044-30	Capacitor, line isolation .05 Mfd., 400 V.
10	2044-29	Capacitor, audio coupling .01 Mfd., 200 V.
11	2044-29	Capacitor, audio coupling .01 Mfd., 200 V.
12	2044-32	Capacitor, bias osc. screen bypass .1 Mfd., 200 V.
13	2044-31	Capacitor, bias osc. coupling .5 Mfd., 200 V.
14	2044-32	Capacitor, erase head bypass .1 Mfd., 400 V.
15	2044-32	Capacitor, RF bypass .1 Mfd., 400 V.
16	2044-33	Capacitor, 2nd AF grid bypass 250 Mmf., 500 V.
17	2044-34	Capacitor, fixed trimmer 1000 Mmf., 500 V. ±5%
18	2044-35	Capacitor, osc. grid cap. 400 Mmf., 500 V.
19		Capacitor, bias osc. plate bypass 50 Mmf., 500 V.
20	2044-15	Volume control, 500K ohm (includes AC switch)
21	2044-18	Resistor, 1st AF cathode 3300 Ohm, ½ Watt
22	2044-19	Resistor, 1st AF plate load 270K Ohm, ½ Watt
23	2044-17	Resistor, 2nd AF grid 470K Ohm, ½ Watt
24	2044-18	Resistor, 2nd AF cathode 3300 Ohm, ½ Watt
25	2044-19	Resistor, 2nd AF plate load 270K Ohm, ½ Watt
26	2044-20	Resistor, output cathode 150 Ohm, ½ Watt
27	2044-23	Resistor, bias osc. grid 22K Ohm, ½ Watt
28	2044-24	Resistor, bias osc. screen 15K Ohm, ½ Watt
29	2044-23	Resistor, decoupling 22K Ohm, ½ Watt
30	2044-21	Resistor, filter 2200 Ohm, 1 Watt
31	2044-22	Resistor, filter 470 Ohm, 1 Watt
32	2044-22	Resistor, filter 470 Ohm, 1 Watt
33	2044-25	Resistor, rectifier bypass 27 Ohm, 1 Watt
34	2044-16	Resistor, microphone shunt 1 Meg., ½ Watt
35	2044-2	Transformer, output
36	2043	5" PM speaker
37	Part of 2043	Cone (3.2 ohm voice coil)

Ref. No.	Part No.	DESCRIPTION
38	2044-7	Bias osc. coil
39	2044-6	RF choke coil
40	2044-5	Switch, record-listen
41	2044-4	Switch, motor start
42	2044-3	Relay (110V. D.C., 10 MA.)
43	2044-8	Rectifier, selenium (100 MA.)
44	2001	Motor
45	2042	Microphone (crystal)
		MECHANICAL
46	2016	Magazine back
46	2017-1	Magazine cover—metal
47	2049	3/16" Truarc retainer
48		Fiber washer
49		Felt washer
50	2010	Pressure roller
51	2005	Arm pivot pin (rivet)
52	2004-11	Pressure roller arm and shaft (for item 50)
53	2014	Spring for pressure roller arm
54	2007-8	Capstan shaft and wheel
55	2048	Hairpin retainer
56	2019	Tape baffle
57		Paper and felt washers
58	2002	Idler wheel
59	2024	Magazine catch spring
60		Shoe mounting screw 6-32 x ½
61	2021-2	Tape guide shoe
62	2003	Guide shoe mounting spacer
63	2036	Spacer angle for magazine support
64	2018-23	Head pressure spring
65	2054	Record/playback head (exchange only)
66	2039	Head positioning spring
67	2053	Erase head (exchange only)
68	2021-2	Tape guide shoe
69	2020	Taper tension and automatic stop spring contact
	2034	Contact or head spring bracket
70	2006	Spring for idler arm
71	2009-1	Capstan bearing
72	2012-31	Idler wheel arm and shaft (for item 58)
73	2027	Motor mounting plate
74	2050	½" Truarc retainer
75	2015	Machine plate

MARKEL
MODELS 70 AND 71

FIG. 1

GENERAL INFORMATION

The MARKEL Duo Playmaster is designed to play automatically twelve 10-inch or ten 12-inch records, not intermixed, one side or both sides, without interruption, in sequence, and without turning them over. The MARKEL Duo Playmaster automatically stops and shuts off upon completion of the last record. Manual operation is provided for playing warped, home recordings, and odd-sized records.

The MARKEL Duo Playmaster has a pickup cartridge of the semi-permanent twin stylus type, whose output is between .5 and 1 volt. This unit is easily adaptable to conventional amplifiers.

The motor operates on 115 to 117 volts, 60 cycle A.C.

The electrical circuit operates on 6 to 10 volts, momentary contact only. 1 ampere is required for operation of cycling mechanism and automatic shutoff.

MARKEL
MODELS 70 AND 71

MANUFACTURED BY

MARKEL ELECTRIC PRODUCTS, INC.

Duo Playmaster Division

145 SENECA STREET • BUFFALO 3, N. Y.

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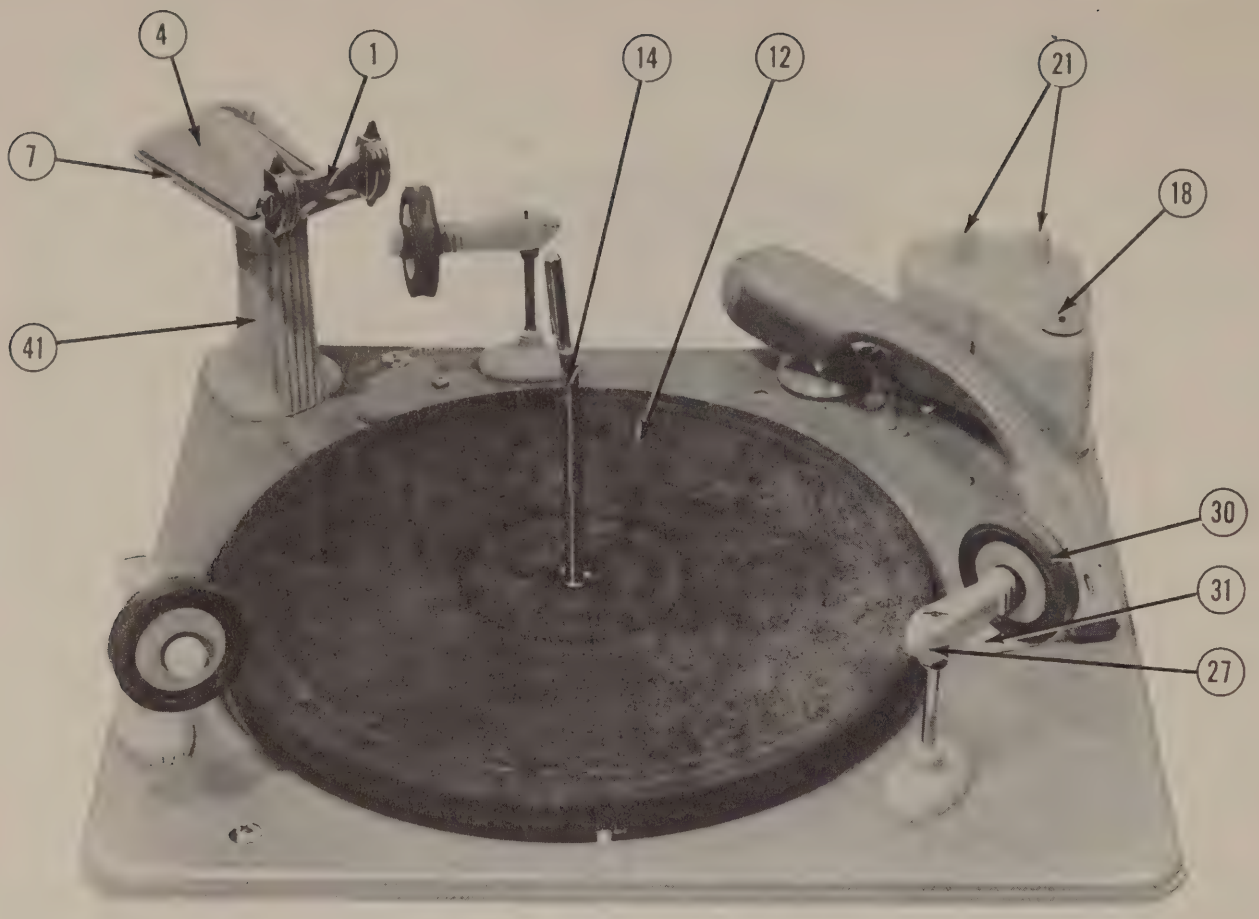

FIG. 2—TOP VIEW

AUTOMATIC OPERATION

In placing the MARKEL Duo Playmaster in operation, the following procedures are necessary to assure proper operation of the mechanism in playing the entire stack of records and in automatically shutting off upon completion of the last record.

1. Before loading records, be sure that the tone arm is resting on the rubber pad (31) and that all three wheels are in correct non-playing position as shown in Fig. 2.

2. Turn the record support shelf (7) for 10-inch or 12-inch records by firmly grasping the shelf and rotating (either direction) one half revolution until the detent of the 10-12 change cam (48) indexes the shelf; fold back the record stabilizer (1) away from the spindle.

3. Place a series of not more than twelve 10-inch records or not more than ten 12-inch records on the spindle, allowing them to rest on the spindle step and the record support shelf (7).

4. Fold back the record stabilizer (1) so that it rests on the top record of the stack.

5. Turn the control knob (18) to whatever sequence of operation is desired—two sides or one side. When the control knob is set at two sides, both sides of all records in the stack—beginning with the underside of the bottom record—will automatically be played. When the control knob is set at one side, one side of all records in the stack—beginning with the top side of the bottom record—will be played.

6. Press the "On" button completely down and release it slowly. This will start the motor and the change cycle. If the motor starts but the change cycle does not, press the "On" button down again, completely and firmly, and be sure to release it slowly.

NOTE: When the "On" button is held all the way down, the motor will stop; when the button is released the motor will start and the change cycle will continue.

7. Any record can be rejected by pressing the "Reject-On" button down completely and firmly and releasing slowly. (When the control knob (18) is set at "Manual," the "Reject" button will not operate.)

8. To shut the changer off before the last record is completed, press the "Off" button.

CAUTION: For best performance do not leave changer with records resting on wheels or with wheels resting on turntable.

9. After automatic shut off occurs, lift the tone arm from the record and place it on the rubber pad (31).

10. Remove the records. Records should not be left stored on the turntable or on the step of the spindle. This may cause warping of records.

MANUAL OPERATION

The following procedure is necessary to operate the changer manually, such as playing odd-size, warped, home recordings, or single record selections:

1. Rotate the record support (7) to the 12-inch position. (If the wheels are on the turntable, press the "On"

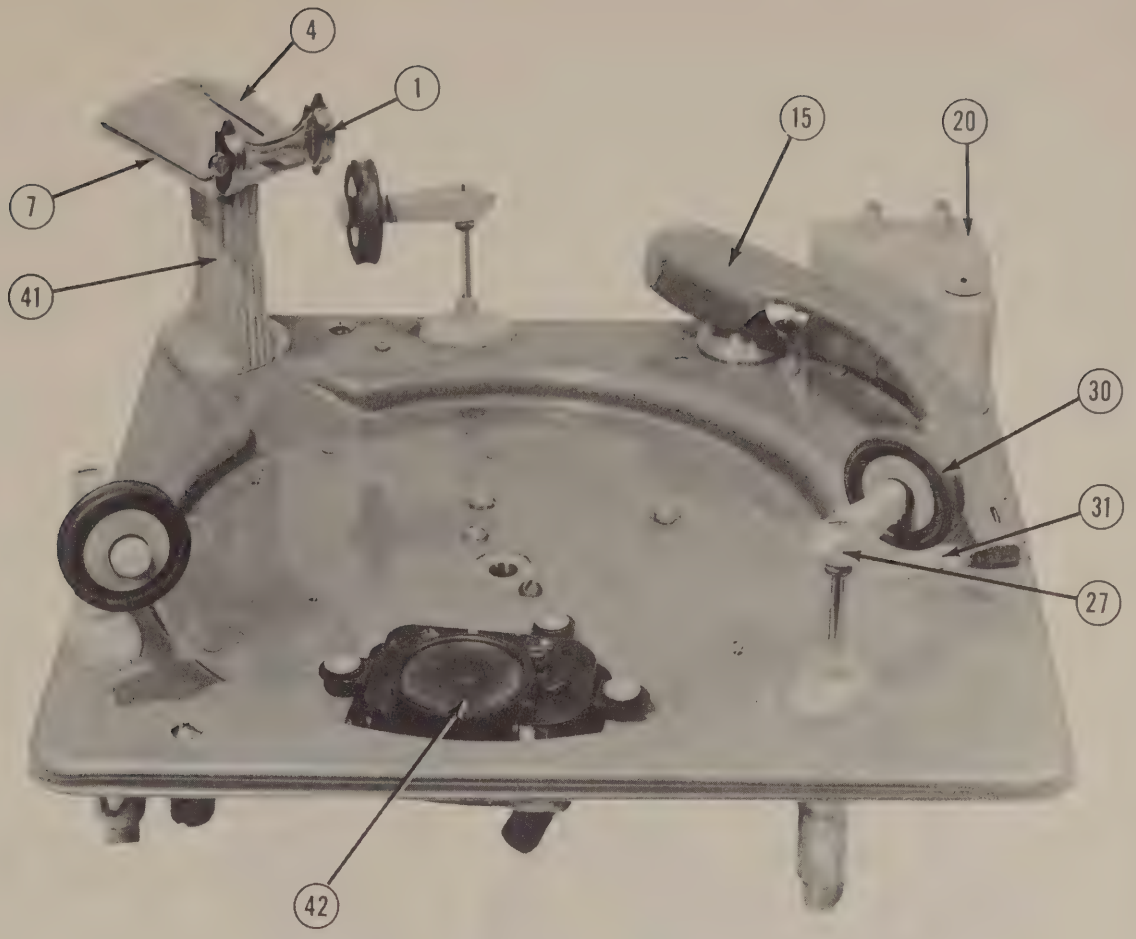

FIG. 3—TOP VIEW LESS TURNTABLE AND SPINDLE

button—and when the machine cycles, the wheels will automatically move off the turntable.)

2. Move the record stabilizer (1) away from the spindle.

3. Turn the control knob (18) to "Manual" position.

4. Place the record to be played on the turntable.

5. Push down on the "Reject-On" button and release.

6. Raise the tone arm from its rest position and place it on the starting groove of the record.

7. The mechanism will shut off automatically at the end if the record has a standard eccentric groove. If the mechanism does not stop, press the "Off" button.

8. Raise the tone arm from the record and place it on the rubber pad.

9. Remove the record from the turntable.

CHANGE CYCLE

As the tone arm moves toward the center of the record, the tone arm collar assembly (74), which is fastened to the tone arm mounting bracket (15D), moves toward the trip switch (85). At the completion of the playing of the record, when the needle enters the eccentric groove, the trip screw (76) of the collar assembly (74) engages the trip switch (85), thus closing the trip switch and energizing the solenoid (98B). Energizing the solenoid pulls the starting pawl (98A) of the main cam (98) Fig. 5, causing the teeth of the pawl to mesh with turntable gear (95). This starts the cam (98) rotating, thus starting the change cycle.

As the cam (98) rotates, the hooked end of the tone arm follower (91) moves out of the recess (98H), shown in Fig. 6, closing the muting switch (93).

The tone arm riser lever (101) rides up the incline portion of track (98G), shown in Figs. 6 and 7, actuating the lift pin (17) which, in turn, raises the tone arm from the record.

The tone arm follower (91), riding around the cam face (98F), pivots the retracting lever (91B)—which is staked to the tone arm follower—against the horizontal adjustment pin of the tone arm collar assembly (74), swinging the tone arm out clear of the records. The tone arm drop lever link (87), which is connected to the retracting lever (91B) and the drop lever (88A) of the assembly (88) Fig. 4, pivots the drop lever around the horizontal adjusting pin as the tone arm is being moved out.

Also, at this stage of the cam rotation when the control knob is in position marked "2 sides," the selector lever (82) is pivoted clear of the path of the cam gate boss (98C) and the cam gate (98C) is switched from one side to the other by the pin of the main cam follower (92). On the next rotation, this shunts the main cam follower pin into the inner cam track (98E) for playing the underside of the record or into the outer cam track (98D) for playing the top side of the record. If the control knob (18) is in the position marked "1 side," the boss on the cam gate (98C) contacts the flange on the selector lever assembly. (82), pivoting the gate outward so that the pin of the main cam follower (92) always remains in the outer track (98D) of the cam.

As the tone arm moves outward, the riser heads (27) and wheels (30) are rotated inward by the movement of the main cam follower through the following connected parts: the formed wheel turn lever (63), the

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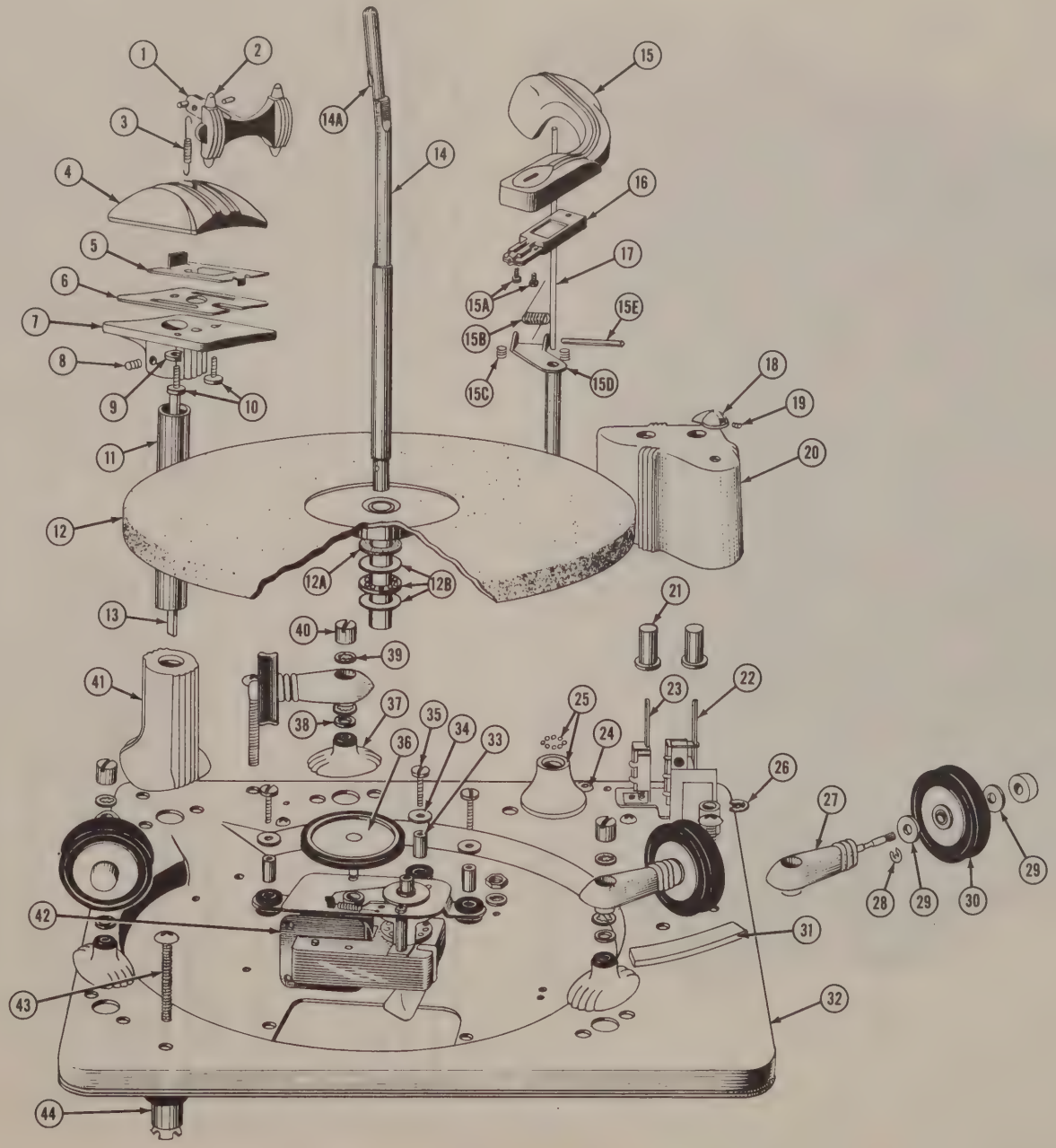

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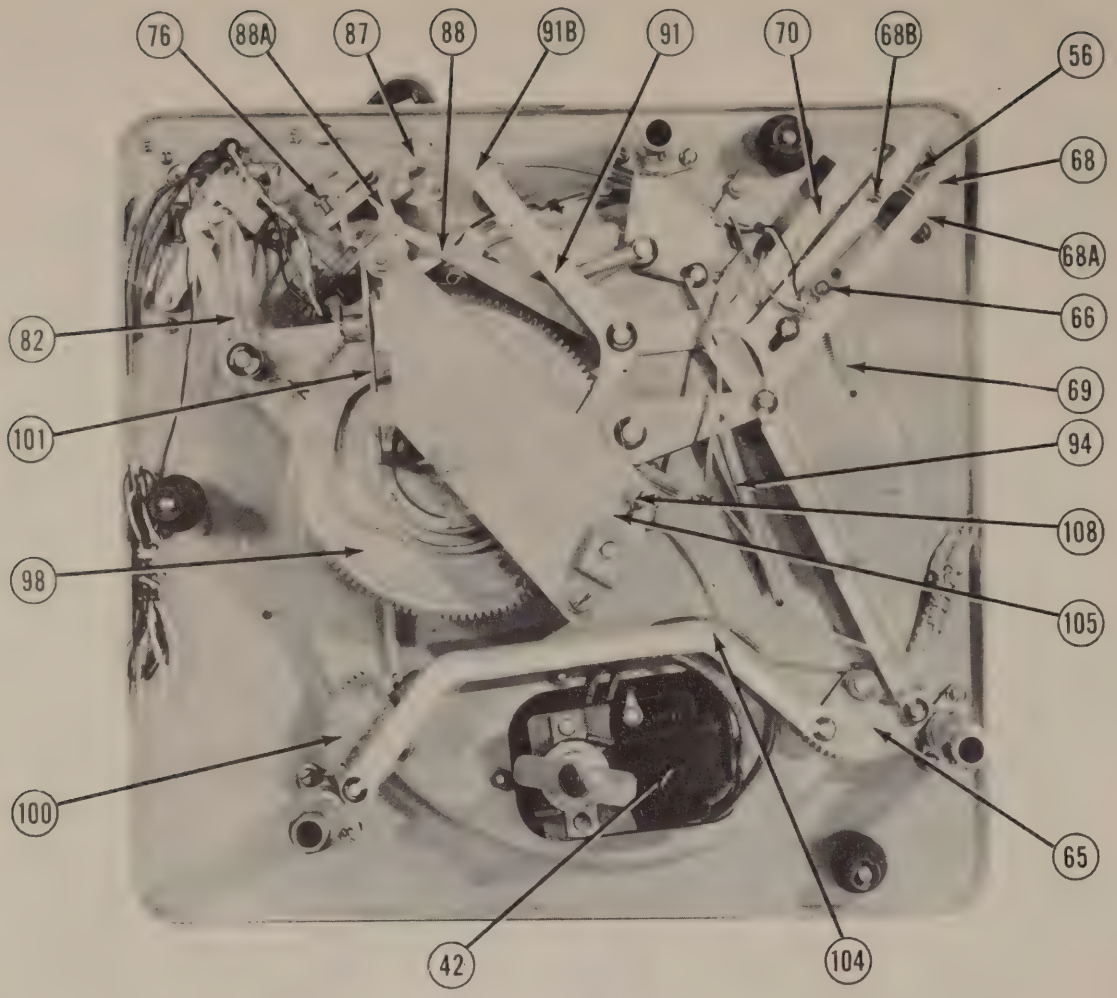


FIG. 4—BOTTOM VIEW

straight wheel turn lever (64), and the offset wheel turn lever (104). The stud on the straight wheel turn lever (64) also actuates the push off cam assembly (68) which, in turn, actuates the push off lever (13) and the push off slide plate (6), thereby dropping a record to the wheels. As the cam follower pin (92) moves by the cam gate (98C), Fig. 5, it is switched into the inner cam track (98E) and the design of the cam track causes the cam follower to continue to pivot the riser heads inward and to lower the wheels to the turntable. During the next change cycle or during one side operation, the cam gate switches the cam follower pin into the outer cam track (98D) and the design of the cam track causes the cam follower to return the riser heads and the push off slide plate to their original positions, thus dropping the record to the turntable.

The shape of the cam face (98F), Fig. 6, and the spring (90) which pulls on the retracting lever (91B) now move the retracting lever (91B) away from the adjustable pin on the tone arm collar assembly (74). This allows the spring (89) to pull on the stop arm (88) and move the tone arm in until the stop arm contacts the 10-12-inch change lever (70). This positions the tone arm for set down. The tone arm is held in a stationary position by the drop lever (88A) until the tone arm comes to a rest on the record.

The tone arm tension arm (84) pivots on the same stud as does the selector lever assembly (82). The other end of the tension arm (84) slides in the groove of the main cam follower (92) and is actuated by this follower. The finger on the tension arm slides in the slot in the link (101A) of the riser lever assembly (101). As a result, when the main cam follower rides in the cam groove (98D), the finger of the tension arm moves against the end of the slot of the link (101A), Fig. 7. This relieves the spring tension on the link, allowing the riser lever (101) to ride down the incline surface of the cam track (98G), Figs. 6 and 7, lowering the tone arm to the record. However, when the control knob is in the position marked "2-Sides," and with the main cam follower riding in the cam groove (98E), the tension arm (84) moves forward allowing the spring (99) to pull on the link (101A), which, in turn, pivots the riser lever (101) upward. This action raises the tone arm to the record.

The hooked end of the tone arm follower (91) now rides into the recess (98H) of the cam, Fig. 6, moving away from the muting switch and causing the drop lever link (87) to snap the drop lever (88A) away from the adjustable pin of the arm collar assembly (74); this gives the tone arm free movement across the record and holds the main cam in a neutral position while the record is playing, and completes the change cycle.

AUTOMATIC SHUTOFF

When the last record is ejected from the record shelf, the record stabilizer (1) drops down against the automatic stop hinge (5), which, in turn, pushes down on the push-off lever (13). As the push-off cam (68) returns the slide plate (6) to its original position, the push-off lever (13) is pulled against the shut-off spring (56), closing the contacts of the bale switch (66). When the record is finished playing, the adjusting screw (76) of the collar assembly (74) contacts the trip switch (85). This closes the circuit energizing the solenoid of

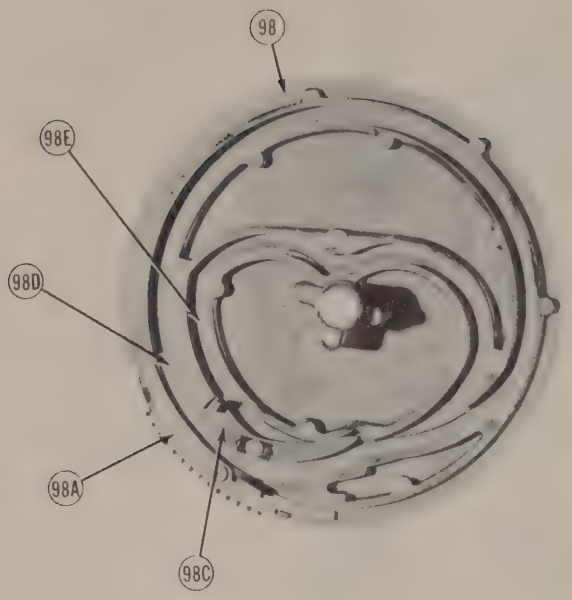


FIG. 5—MAIN CAM TOP VIEW

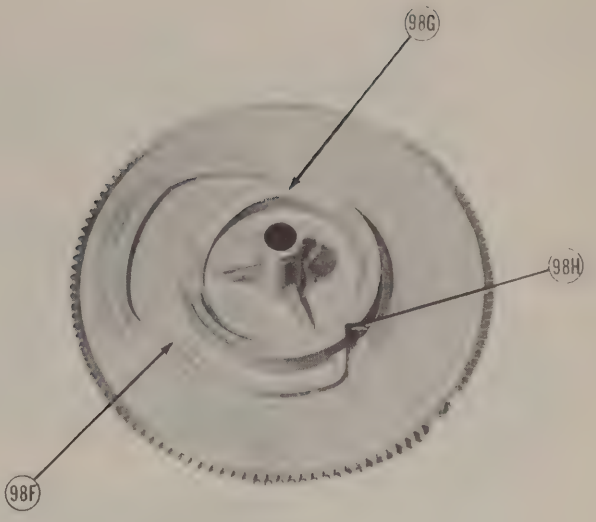


FIG. 6—MAIN CAM BOTTOM VIEW

the main switch (22), tripping the switch and shutting off the unit.

MANUAL POSITION

Normally the manual switch (79) is held in a closed position; however, when the control is turned to "Manual," the switch (79) is opened, thereby removing the power from the trip solenoid (98B).

REMOVING THE SPINDLE

To remove the spindle, remove the screw holding the center post spring (105); then remove the spring from the center post. The center post may now be removed by lifting it straight up.

In replacing the center post, be sure the ledge of the center post is facing away from the push-off shelf (7). Insert the spring in the center post and replace the spring and screw in their proper places.

REMOVING THE TURNTABLE

In removing the turntable, it is necessary to first remove the spindle then loosen the two set screws (96) holding the turntable gear (95) to the turntable shaft. After this is done, the turntable may be removed by lifting it straight up.

In replacing the turntable, be sure to replace the felt washer (12A) and the thrust bearing assembly (12B) in their proper positions as shown in the exploded view. Push the idler wheel (36) back out of the way so that the turntable will be seated and the idler wheel will contact the rim of the turntable. Also, before the turntable is seated, the turntable shaft must be inserted in the turntable gear (95).

After these steps have been taken, push the turntable gear up, leaving a space of approximately .005" between the gear and the bearing in the center bearing support (97). Tighten the set screws.

RECORD SUPPORT ALIGNMENT

Proper alignment of the record support is necessary for proper record ejection:

1. Be sure the mechanism is out of cycle.
2. Rotate the record shelf to the 12-inch position.
3. Place a 12" record on the step of the center post (14), allowing it to rest on the support shelf (7).
4. Loosen the set screw (8) and align the curvature of the support shelf (7) to the edge of the record.
5. Tighten the set screw.

TROUBLES AND ADJUSTMENTS

Two Records Drop at Once

1. Hole in record too large:

Check the diameter of the hole in the record. An oversize hole will cause two records to drop at once.

2. Center post slide (14A) not fully down:

If the spindle slide is not all the way down, more than one record may be dropped at a time.

(a) Check the slide to be sure it is free and does not bind at any point. Clean out all foreign material or straighten, if necessary. Do not oil.

(b) When records are placed on the center post, be sure the slide is all the way down.

Record Does Not Drop When Changer Cycles

1. Push-off slide plate (6) out of adjustment:

The slide plate (6) should move far enough forward to push the record off the step of the center post (14).

(a) Loosen the set screw (68B), Fig. 4, and slide the

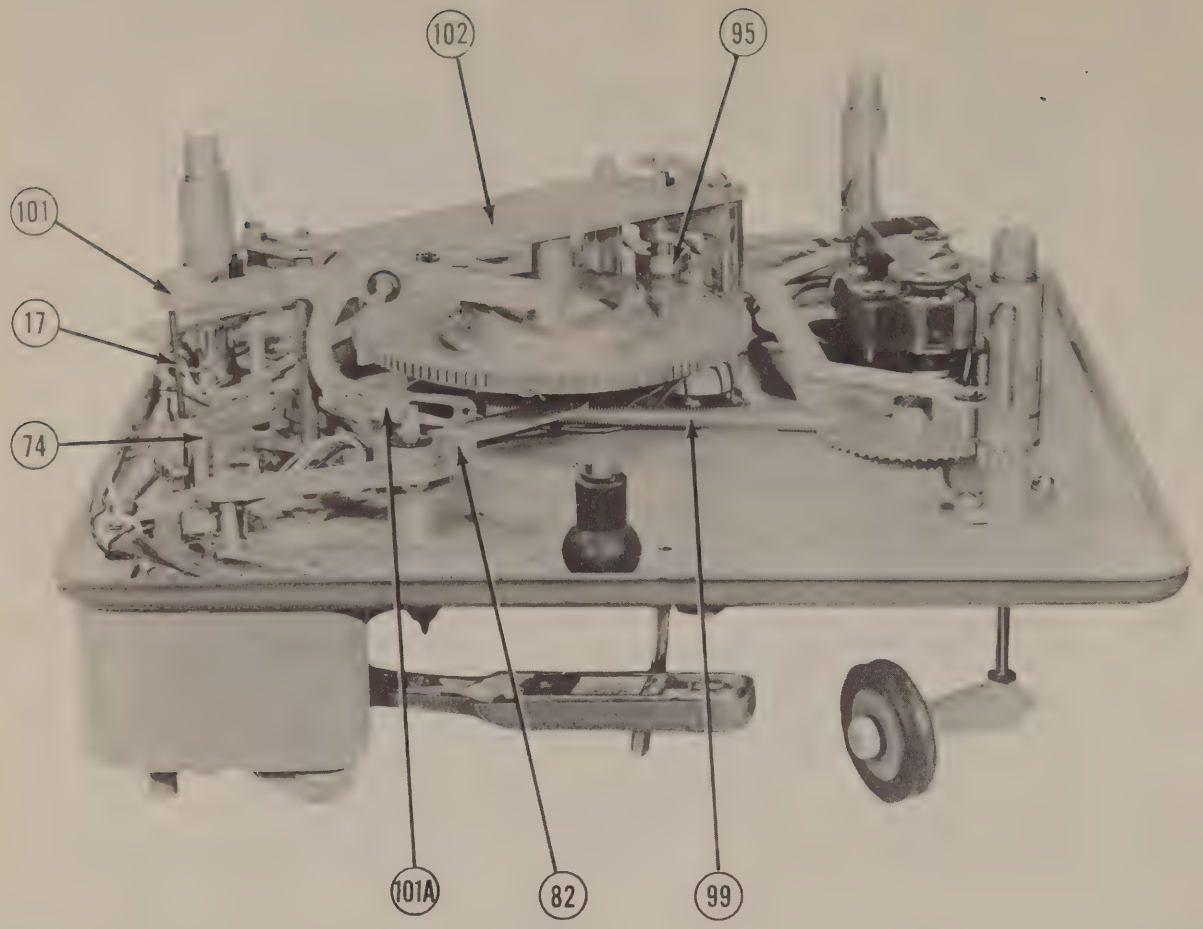


FIG. 7—LEFT SIDE VIEW

push-off cam adjuster (68A) away from the center post. Tighten the screw and check the adjustment.

2. Hole in record too small:

Check the diameter of the hole in the record. An undersize hole will cause the record to hang up on the center post.

3. Screw (68B) loose, thereby allowing the push-off cam adjuster (68A) to slide off the push-off cam (68) instead of actuating the push-off lever (13).

Tone Arm Does Not Move Horizontally When the Mechanism Is Cycling

1. Tone arm lift pin (17) is missing.

2. Cam follower spring (90) loose:

If this spring is loose, the tone arm follower (91) will not be held against the cam face (98F), thereby not actuating the collar assembly (74).

3. Collar assembly (74) loose on the tone arm mounting bracket (15D):

If this condition exists, the tone arm may not be moved with the collar.

Irregular Landing of the Tone Arm

1. Toggle spring (86) loose:

If the toggle spring is loose, the drop lever (88A) will not be snapped around the adjusting pin of the collar assembly (74). If this condition is present, the arm may move slightly, either direction, when it is lowered to the turntable.

2. Collar assembly (74) loose on the tone arm mounting bracket (15D).

3. Adjusting pin in collar assembly (74) loose:

Adjust the pin in the collar assembly as described in "Tone Arm Does Not Set Down Properly On 10-12-Inch Records."

Tone Arm Does Not Set Down Properly On 10-12-Inch Records

1. The set-down adjusting pin out of adjustment:

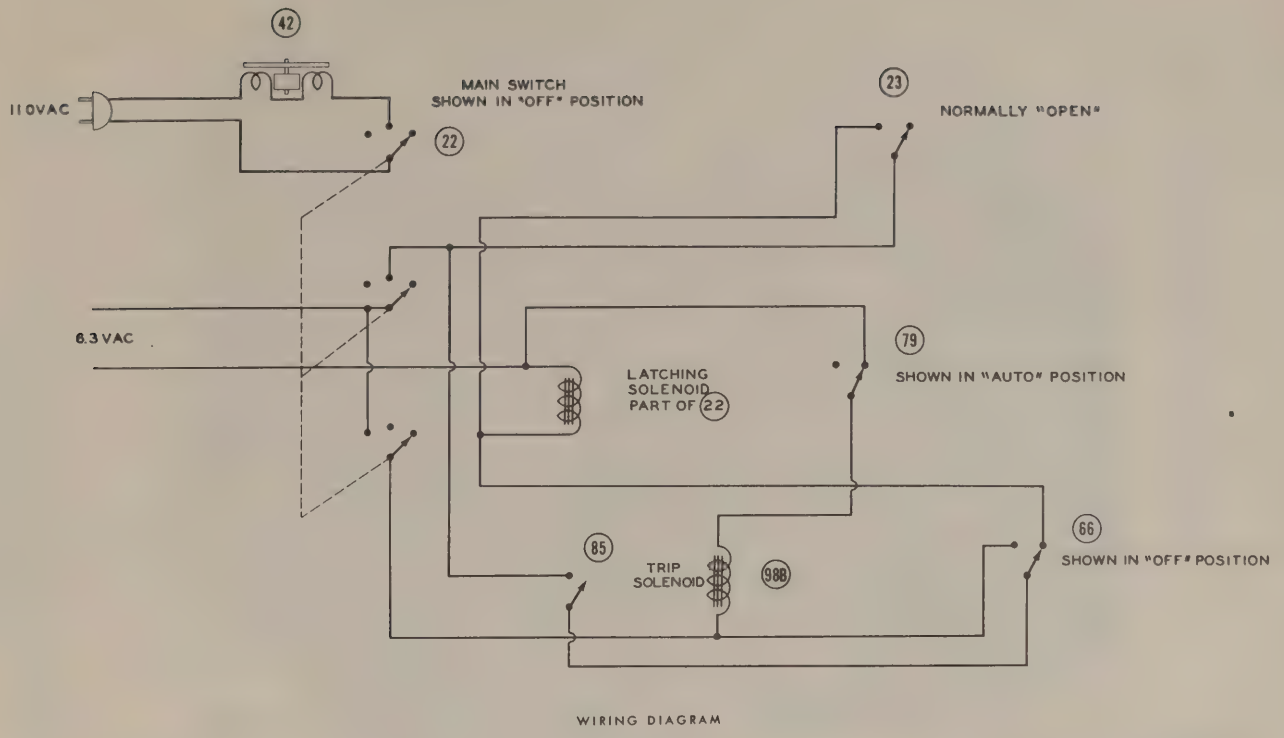
The set-down point of the tone arm is determined by the position of the 10-12-inch change cam (48), which, in turn, actuates the 10-12-inch change lever (70). This lever acts as a stop to the stop arm (88), thereby accounting for the one-inch difference for the set-down point. If the tone arm sets down too far in, or too far out, on a record, it may be adjusted as follows:

(a) Place a 10-inch record on the turntable.

(b) Trip the mechanism, stop the mechanism just as soon as the arm starts to drop to the record. The tone arm is held in a stationary position by the drop lever (88A) Fig. 4.

(c) Hold the tone arm with one hand, using a 3/32" Allen wrench, and loosen the screw in the adjustable pin of the collar assembly (74); this is made accessible through the hole in the base plate (32) near the tone arm post (25).

(d) While holding the Allen wrench in the screw (which helps to stabilize the position of the pin), move the tone arm over the set-down point; tighten the screw, and check the adjustment.



WIRING DIAGRAM

WIRING DIAGRAM

Tone Arm Does Not Raise to Play Underside of a Record

1. Tone arm lift pin (17) is missing.

2. Riser lever spring (99) loose:
This spring applies tension to the link (101A), which, in turn, pivots the riser lever assembly, raising the tone arm to the record. See Fig. 7.

Changer Trips Before Needle Reaches End of Record

1. Trip screw (76) out of adjustment:
The trip screw (76) should be adjusted so that it will close the contacts of the trip switch (85) upon completion of a record. This trip point may be adjusted by turning the screw (76) in to advance tripping, and out to delay the tripping action.

Changer Does Not Cycle When Mechanism Is Tripped

1. Faulty wiring may prevent power being supplied to the solenoid (98B) when the trip switch (85) contacts are closed.

2. Turntable gear (95) loose on turntable shaft.

3. Cam cycling pawl (98A), Fig 5, binding, thereby not being actuated by the solenoid.

Changer Does Not Shut Off After Last Record Has Been Played

1. Faulty wiring: Check the Wiring Diagram; also see "Automatic Shut-Off."

2. Spring (3) loose—not pulling record stablizer (1) down.

3. Spring (56) loose or moved to one side. If this condition exists, the spring (56) will not close the switch contacts when the push-off lever (13) is pushed down and forward.

4. "Reject-On" button binds in plastic switch cover.

Riser Wheels Chatter on Record

1. The wheels should be adjusted so that the wheel shaft in the riser head (27) is directly pointing to the center post. This is done by loosening the cap nut (40) and rotating the riser head. It is necessary to hold the riser shaft (59) firmly while tightening cap nut (40).

LUBRICATION

Lubrication applied at the time of manufacture is usually sufficient for a long period of time; however, should it become necessary to lubricate, due to excessive use or high-operating temperature, the mechanism should be lubricated as follows:

1. Use a good light grease on the teeth, the cam tracks and cam surfaces, and gate of the main cam (98).

2. Turntable thrust bearing assembly (12B).

3. Ball bearings in the post assembly (25).

4. All other pivot and frictional points may be lubricated lightly.

CAUTION: Avoid excessive lubrication. Any grease or lubricant on the starting pawl (98A) will tend to overcome action of the solenoid (98B) and machine will not cycle. Do not, under any circumstances, permit oil or grease to come in contact with the idler wheel (36) or the turntable rim. Any oil or grease at these points should be removed with naphtha.

PARTS LIST—MARKEL MODEL 70

Ref. No.	Part No.	DESCRIPTION
1	B7010	Record stablizer
2	A7012	Rubber bumper for record stabilizer
3	W7008	Record stabilizer spring
4	GP7009	Push-off cap
5	S7026	Automatic stop hinge
6	S7025	Push-off slide plate
7	GP7008	Push-off shelf
8	M449	Set Screw 10-32 x ¼" slotted head
9	Z7017	Kantlink #6 split washer
10	M231	6-32 x 7/16 rd. hd. machine screw
11	U7002	Push-off post shaft
12	A7018	10" turntable assembly
12A	Z7001	Felt washer
12B	A7003	Thrust bearing assembly
13	S7015	Push-off lever
14	R7001	Center post
15	A7019	Tone arm assembly
15A		#2-56 x 5/16" cartridge mounting screw (part of 15)
15B		Tone arm balance spring (part of 15)
15C		Mounting screw, tone arm pivot pin (part of 15)
15D		Tone arm mounting bracket (part of 15)
15E		Tone arm pivot pin (part of 15)
16	A7028	Cartridge—Astatic
17	R7003	Tone arm lift pin
18	GP7014	Turn knob for switch
19	M7015	Allen hd. set screw #5-40 x 3/16 cone point
20	GP7010	Switch cover
21	GP7013	Push knob for switch
22	A7021	Main switch
23	A7022	Shut-off switch
24	A7025	Rubber grommet
25	B7009	Tone arm post and ball-bearing assembly
26	Z7004	"C" washer
27	GP7004A	Riser head assembly (including GP7004 riser head, E7025 wheel shaft)
28	Z7006	"C" washer
29	Z7008	Felt washer
30	A7011A	Wheel assembly (including GP7005 plastic wheels, A7010 bushings, A7011 rubber tire)
31	A7013	Rubber pad for tone arm
32	S7001	Base plate
33		Spacer (part of 42)
34		Washer
35		Mounting screw (part of 42)
36		Idler wheel (part of 42)
37	GP7006	Riser bushing
38	Z7016	Flat washer
39	Z139	Inside type shakeproof washer #8
40	E7035	Slotted cap nut—riser shaft
41	GP7007	Push-off post
42	A7001	Motor assembly (including 33, 34, 35, and 71)
43	M7013	10-32 x 1½ Phillips hd. machine screw
44	A7016	Rubber mounts
45	E7015	Push-off cam post stud
46	Z138	Inside shakeproof type washer #6
47	M158	10-24 x 5/16 rd. hd. machine screw
48	B7008	10-12-inch change cam
49	M7001	Set screw, 10-32 x 3/16 Allen head
50	B7011	Inside barrel
51	Z139	Inside shakeproof type washer #8
52	M254	8-32 x 7/16 rd. hd. machine screw
53	Z7007	"C" washer—riser barrel
54	Z7015	Spacer
55	Z7015	Spacer
56	W7015	Flat spring, shut-off
57	F218	Hex nut
58	B7012	Outside barrel
59	E7026	Wheel riser shaft
60	Z7010	"C" washer—riser shaft
61	U7005	Bushing—riser barrel
62	W7016	Riser head spring
63	S7010	Formed wheel turn lever
64	S7012	Straight wheel turn lever
65	B7007-1	Quadrant gear
66	A7006	Bale switch
67	Z7005	"C" washer
68	S7013	Push-off cam assembly (includes item 66)
68A	S7030	Push-off cam adjuster
69	W7003	10-12-inch change lever spring
70	S7016	10-12-inch change lever
71		Hex nut (part of item 42)
72	M7003	Screw riser barrel bushing
73	B7007-2	Quadrant gear
74	B7006	Tone arm collar assembly
75	M7010	#8-32 x 5/8 hex. hd. screw
76	M251	8-32 x 5/8 rd. hd. machine screw
77	F7003	Spring lock nut
78	S7032	Manual switch bracket
79	A7023	Manual switch
80	E7032	Selector control shaft
81	Z7004	"C" washer
82	S7022	Selector lever assembly (includes S7023 aux. selector lever and W7013 selector lever spring)
83	W7013	Selector lever spring
84	S7008	Tone arm tension arm
85	A7008	Trip switch
86	W7004	Toggle spring
87	S7021	Tone arm drop lever link
88	S7017	Tone arm stop arm assembly
88A	S7018	Tone arm drop lever assembly
89	W7005	Tone arm stop lever spring
90	W7006	Tone arm cam follower spring
91	S7019	Tone arm follower assembly
91B	S7020	Tone arm retracting lever assembly
92	S7009	Main cam follower
93	A7026	Muting switch
94	W7009	Main cam follower spring
95	B7013	Turntable gear
96	M7015	Allen head cone point set screw #5-40 x 3/16
97	B7002	Center bearing support assembly
98	B7003	Main cam assembly
98B	A7015	Trip solenoid
99	W7002	Tone arm raise lever spring
100	B7007-3	Quadrant gear
101	S7005	Tone arm riser lever and link assembly
101A		(Link S7006 included)
102	S7004	Cam plate
103	F3003	Hex nut 10-32
104	S7011	Offset wheel turn lever
105	W7012	Center post spring
106	S7035	Center post bracket
107	Z1004-1	Internal tooth lock nut #10
108	M358	#10-32 x 3/8 rd. hd. machine screw

SILVERTONE MODEL
8073 (Ch. 135.243)

SILVERTONE MODEL
8073 (Ch. 135.243)

TRADE NAME	Silvertone Model 8073 (Ch. 135.243)
SUPPLIER	Sears Roebuck and Co., 925 S. Homan St., Chicago, Illinois
TYPE SET	AC Operated Radio-Phonograph Combination with Loop Antenna
TUBES (FIVE)	Types 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT DET.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC — RATING .260 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial turn tuning gang fully closed and set the last calibration mark on the low frequency end of the dial even with the indicator mark on the cabinet.

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator of rear section of tuning gang.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A5	"

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1	Converter	12SA7GT	12SA7GT	8AD	
V2	IF Amp.	12SK7GT	12SK7GT	8N	
V3	DET.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
V4	Power Output	50L6GT	50L6GT	7AC	
V5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	F-5051	PRS150/40-40	EDL4415		TA-440	Filter Blue
B	40	150						Filter Red
C2	.05	200	F-1345	P288-05	PTE4S5		TM-15	AVC Filter
C3	.05	200	F-1345	P288-05	PTE4S5		TM-15	AVC Filter
C4	.05	200	F-1345	P288-05	PTE4S5		72P51	Line Isolation
C5	.09	200	F-4957	P288-1	PTE4P1		TM-1	Phono Isolation
C6	100	500	F-1374	1468-0001	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C7	.005	600	F-4894	P688-005	PTE6D5	GP2M-005	TM-25	Audio Coupling
C8	.0005	1000	F-4890	1468-0005	5W5T5	GP2K-500	1FM-35	AF Amp. Plate Bypass
C9	.01	400	F-1344	P488-01	PTE4S1	GP2-335-01	TM-11	Audio Coupling
C10	.02	400	F-1376	P488-02	PTE4S2		TM-12	Output Plate Bypass
C11	.05	400	F-1346	P488-05	PTE4S5		TM-15	Rect. Bypass

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	
R1A	500KΩ	½	F-6239	Q13-133	AM-60-Z	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions

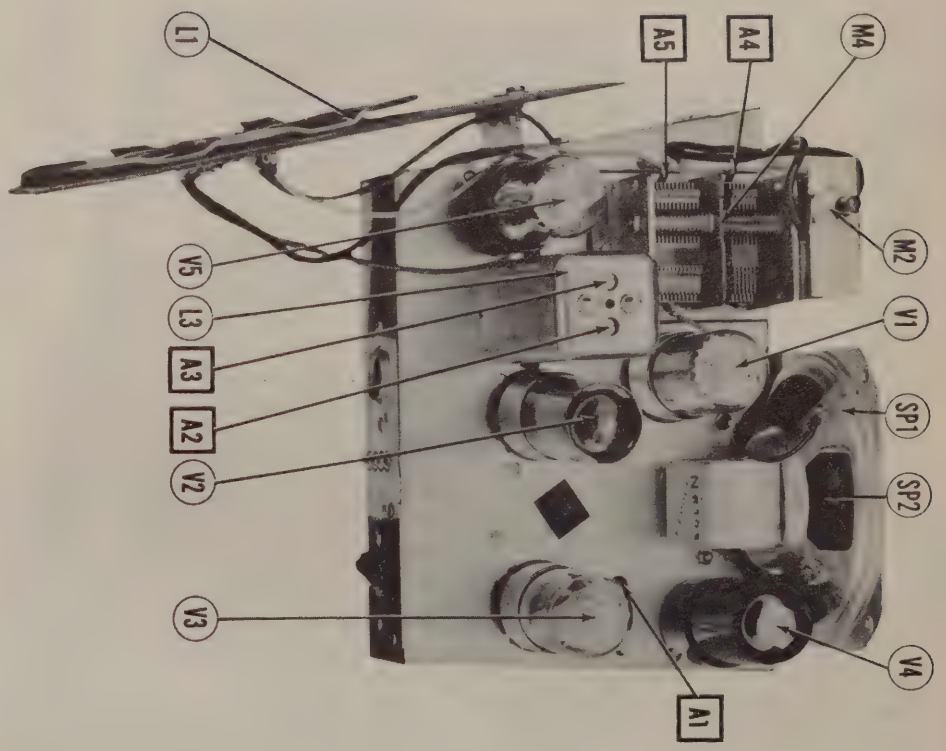
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	SILVERTONE PART No.	IRC PART No.	
R2	22KΩ	½	F-4025	BTS-22K	Osc. Grid
R3	1 Meg.	½	F-1262	BTS-1 Meg.	AVC Network
R4	51KΩ 5%	½		BTS-47K-5%	Diode Filter
R5	6.8 Meg.	½	F-4028	BTS-6.8 Meg.	AF Grid
R6	220KΩ	½	F-4026	BTS-220K	AF Plate
R7	180Ω	½	F-4067	BW-½-180	Output Cathode-Wire Wound
R8	470KΩ	½	F-4027	BTS-470K	Output Grid
R9	1000Ω	2	F-5358	BW-2-1000	Filter-Wire Wound
R10	1 Meg.	½	F-1262	BTS-1 Meg.	Tone Compensation
R11	220KΩ	½	F-4026	BTS-220K	Isolation

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2600Ω	3.5Ω	300Ω Tap at 13Ω	.5Ω	F-4875	A-3330	A-3031	RO-3	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113		
SP1	PM	3.5Ω	F-6102	MOD. P4-X	4A07	
	CONE DIA.	V. C. DIA.				
*SP2	3 7/8"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: MEISSNER PART No.
L1	Loop Ant.	0Ω	1.3Ω	F-6100	
L2	Osc. Coil	7.5Ω		F-7139	14-1060
L3	Input IF	21Ω	20Ω	F-4813	16-6658
L4	Output IF	29Ω	29Ω	F-4846	16-6661

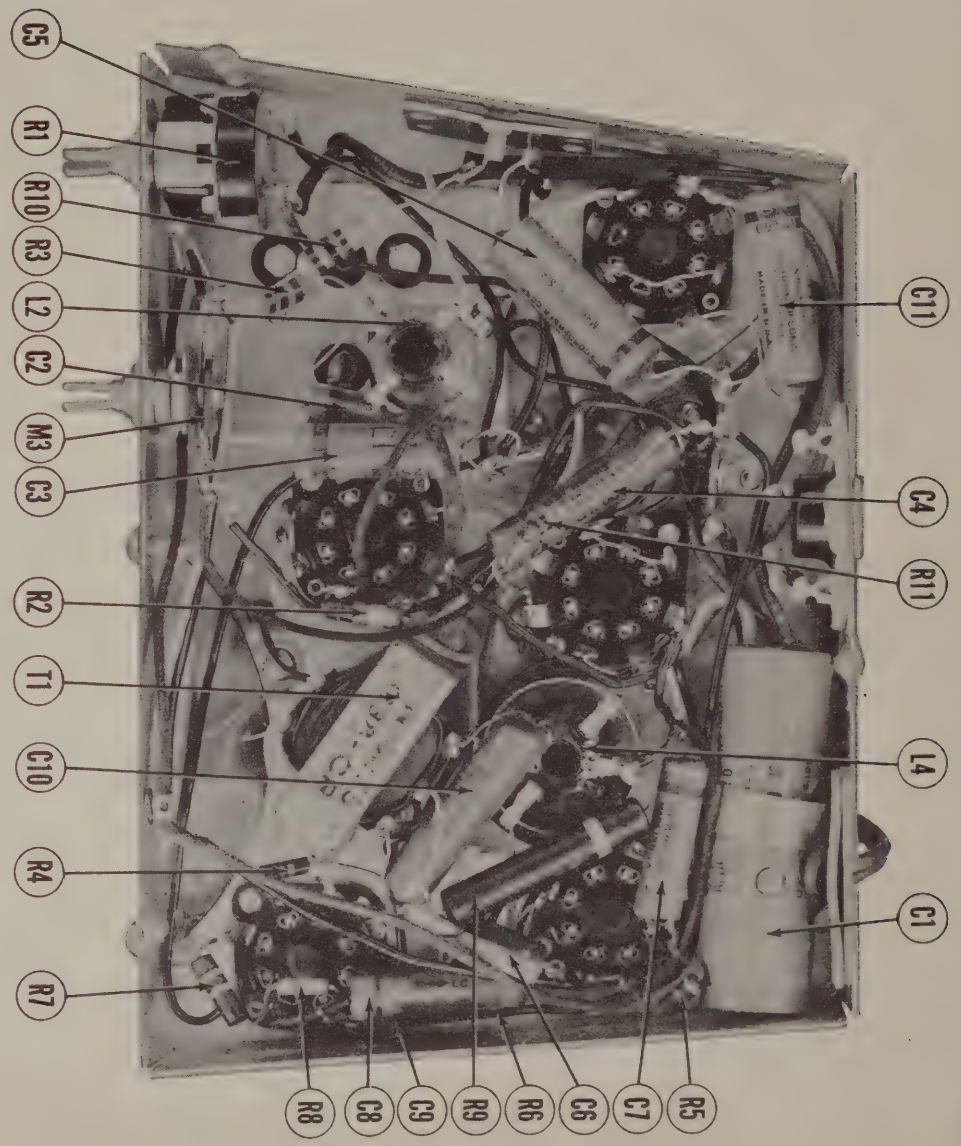
PHONO CARTRIDGE

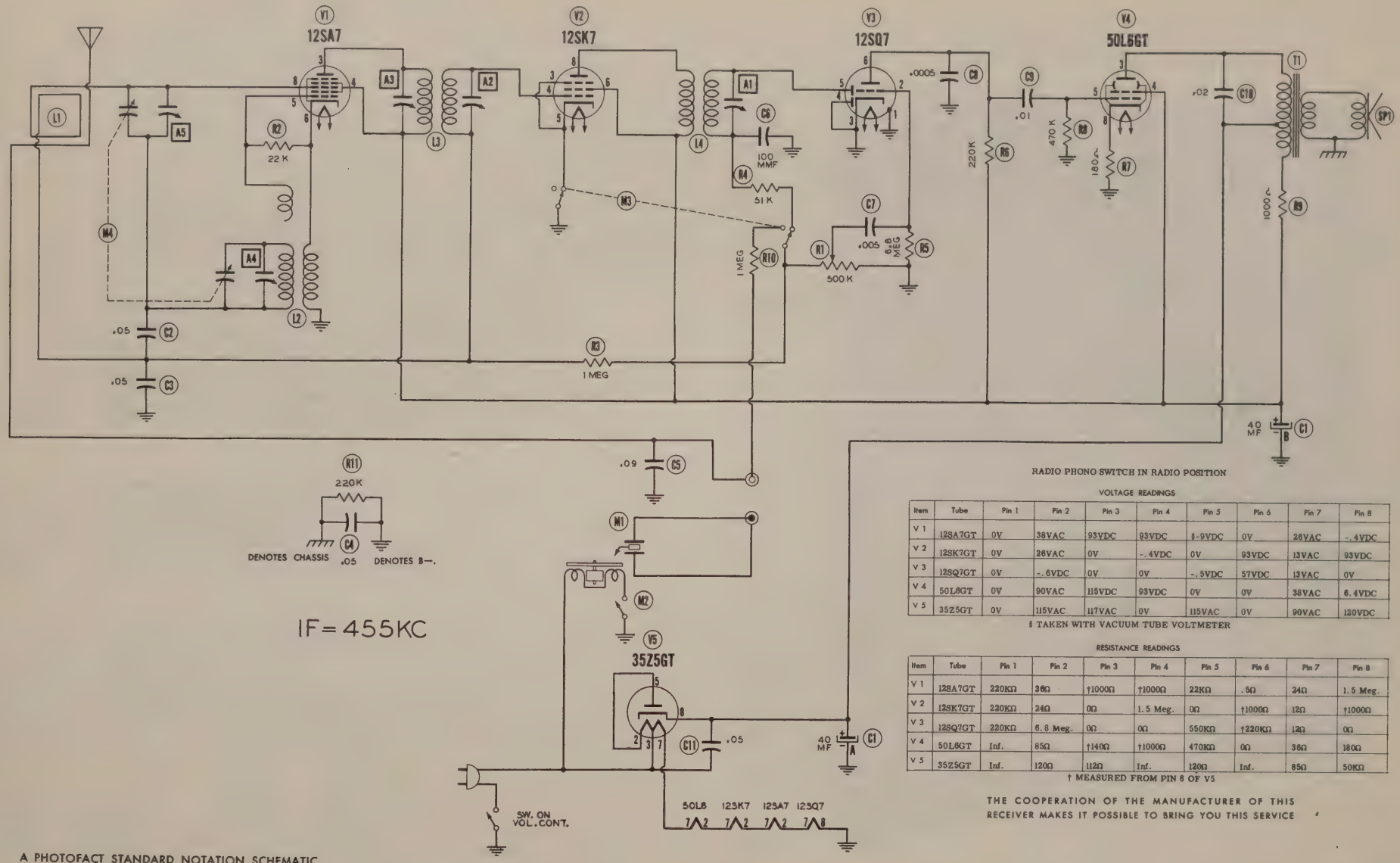
ITEM No.	REPLACEMENT DATA: Silvertone PART No.	ASTATIC PART No.	REMARKS
M1	F-5763	L-70-A	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M2	Switch	F-2094	Phono Motor On-Off
M3	Switch	F-2877	Radio-Phono
M4	2 Gang Var. Cap.	F-7516	(23-385MMF, 21-125MMF)
	Cabinet	F-293	
	Phono Motor	F-7526	Less Turntable

CHASSIS—BOTTOM VIEW





RADIO PHONO SWITCH IN RADIO POSITION

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7GT	0V	38VAC	93VDC	93VDC	8-9VDC	0V	26VAC	-.4VDC
V 2	12SK7GT	0V	26VAC	0V	-.4VDC	0V	93VDC	13VAC	93VDC
V 3	12SQ7GT	0V	-.6VDC	0V	0V	-.5VDC	57VDC	13VAC	0V
V 4	50L6GT	0V	90VAC	115VDC	93VDC	0V	0V	38VAC	6.4VDC
V 5	35Z5GT	0V	115VAC	117VAC	0V	115VAC	0V	90VAC	120VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7GT	220KΩ	38Ω	†1000Ω	†1000Ω	22KΩ	.5Ω	24Ω	1.5 Meg.
V 2	12SK7GT	220KΩ	24Ω	0Ω	1.5 Meg.	0Ω	†1000Ω	12Ω	†1000Ω
V 3	12SQ7GT	220KΩ	6.8 Meg.	0Ω	0Ω	550KΩ	†220KΩ	12Ω	0Ω
V 4	50L6GT	Inf.	85Ω	†140Ω	†1000Ω	470KΩ	0Ω	36Ω	180Ω
V 5	35Z5GT	Inf.	120Ω	112Ω	Inf.	120Ω	Inf.	85Ω	50KΩ

† MEASURED FROM PIN 8 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

SILVERTONE MODEL
9131 (CH. 478.210)

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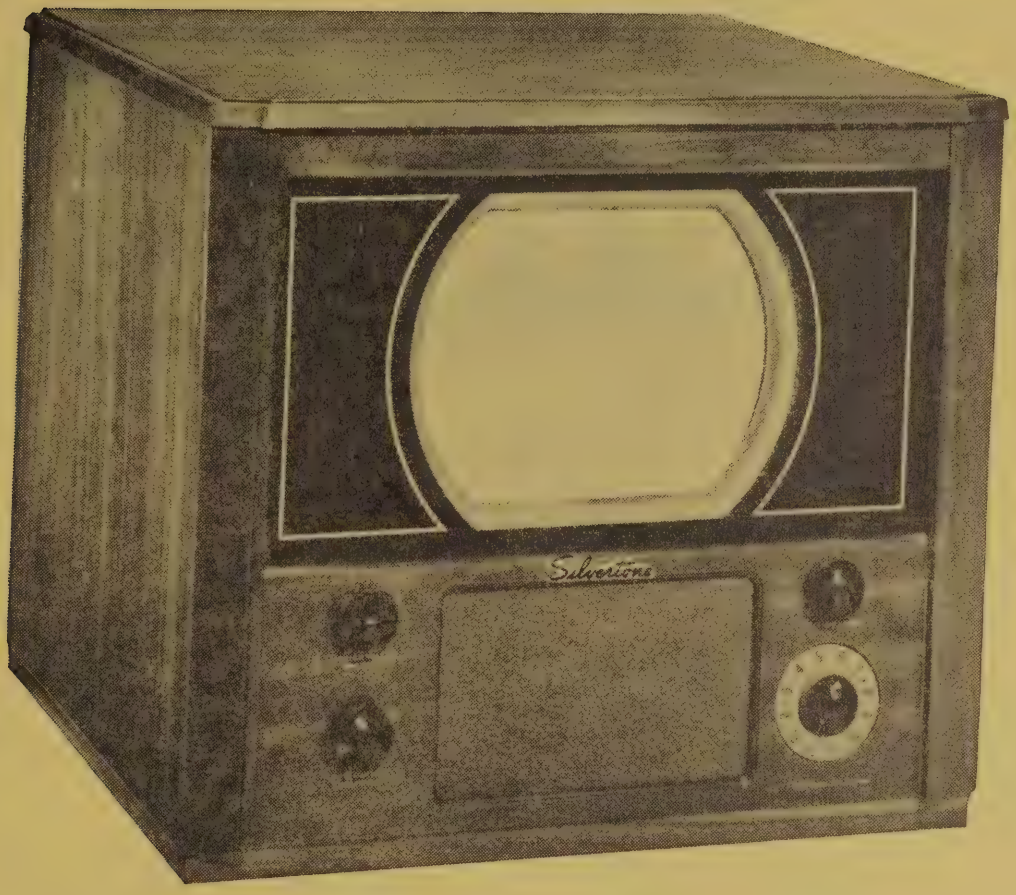

MODEL 9131 (CH. 478.210)

SILVERTONE MODEL
9131 (CH. 478.210)

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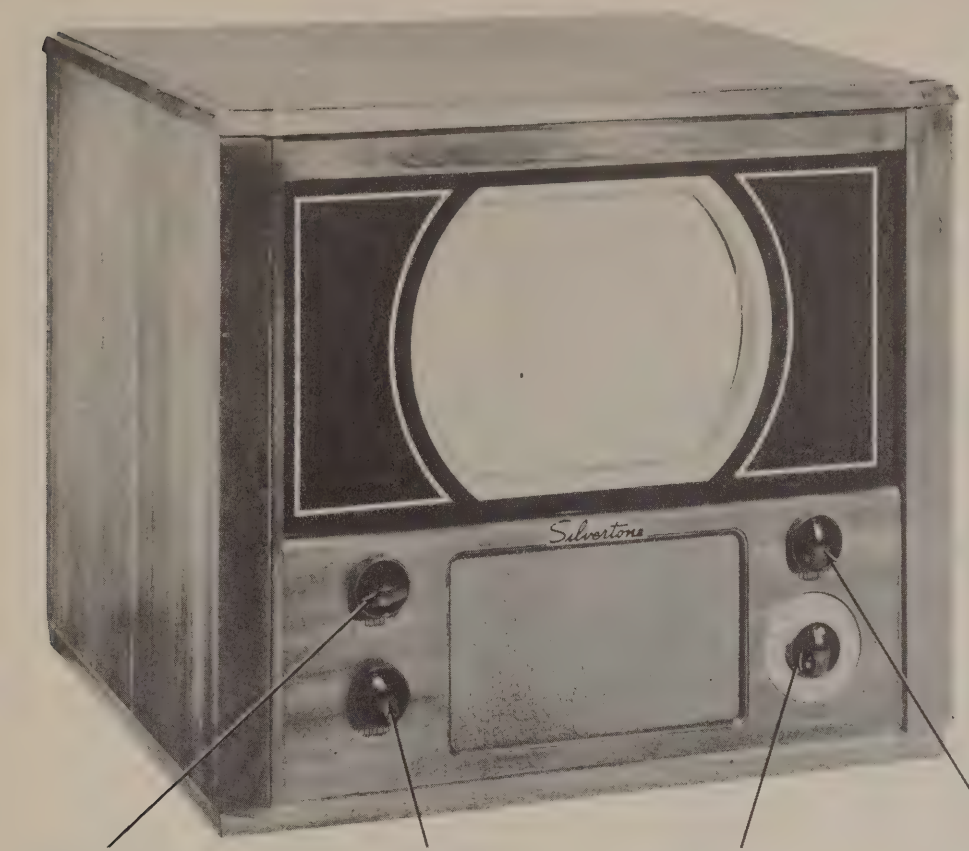

SILVERTONE MODEL
9131 (Ch. 478.210)

TRADE NAME	Silvertone, Model 9131 (Chassis 478.210)
SUPPLIER	Sears Roebuck and Co., 925 S. Homan, Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110 - 120 Volts AC - 60 Cycle RATING 1.88 Amps. @ 117 Volts AC
TUNING RANGE-	Channels 2 thru 13.

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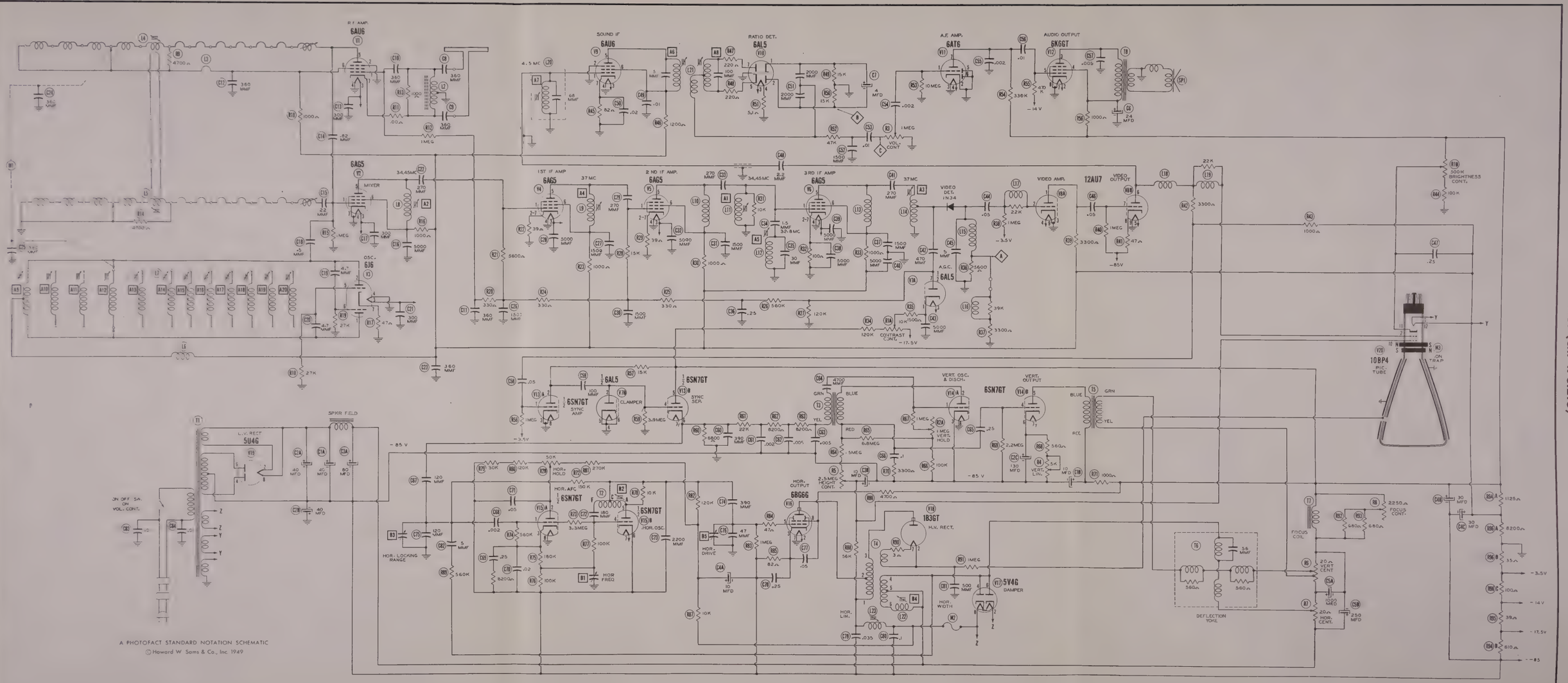
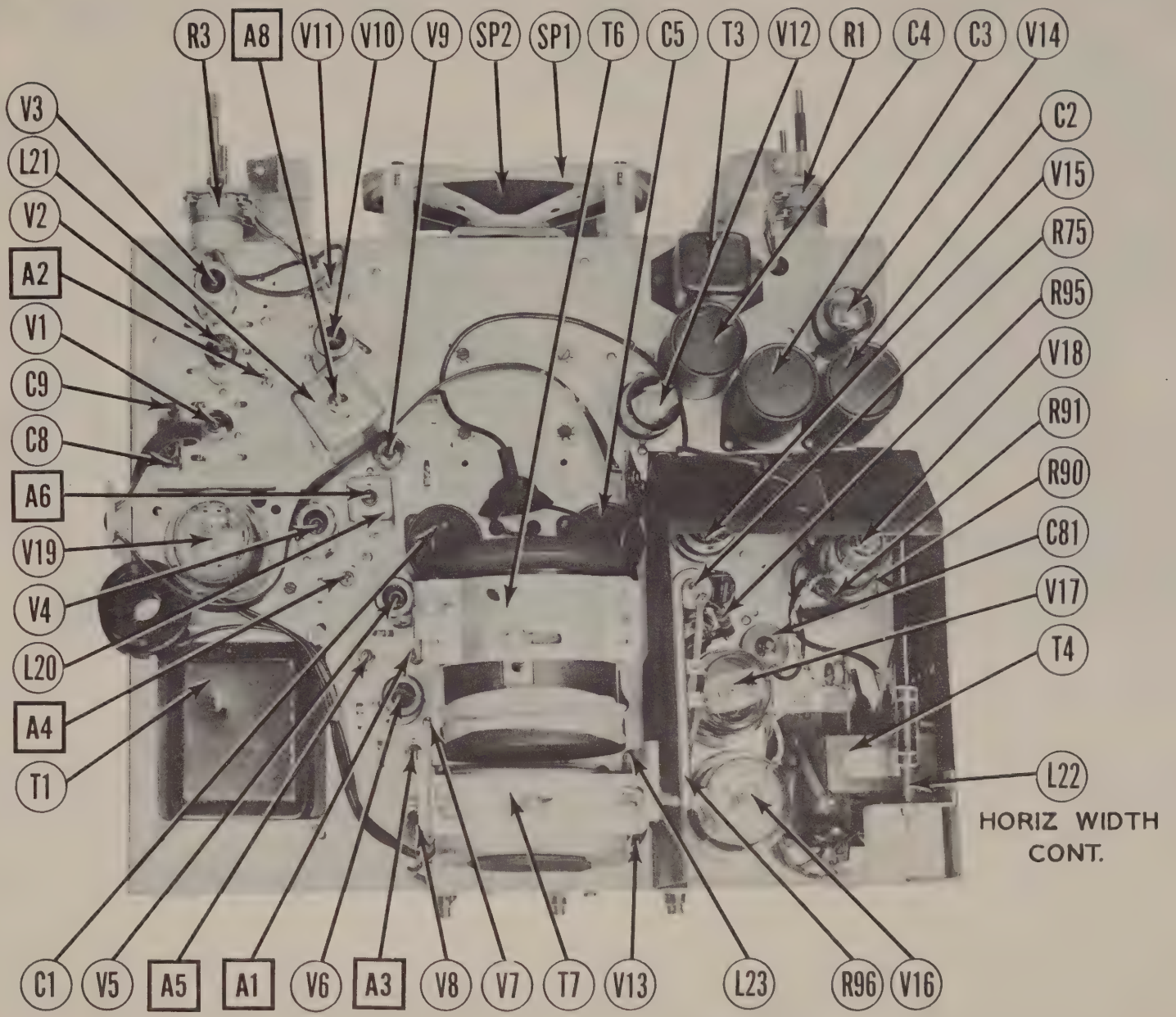
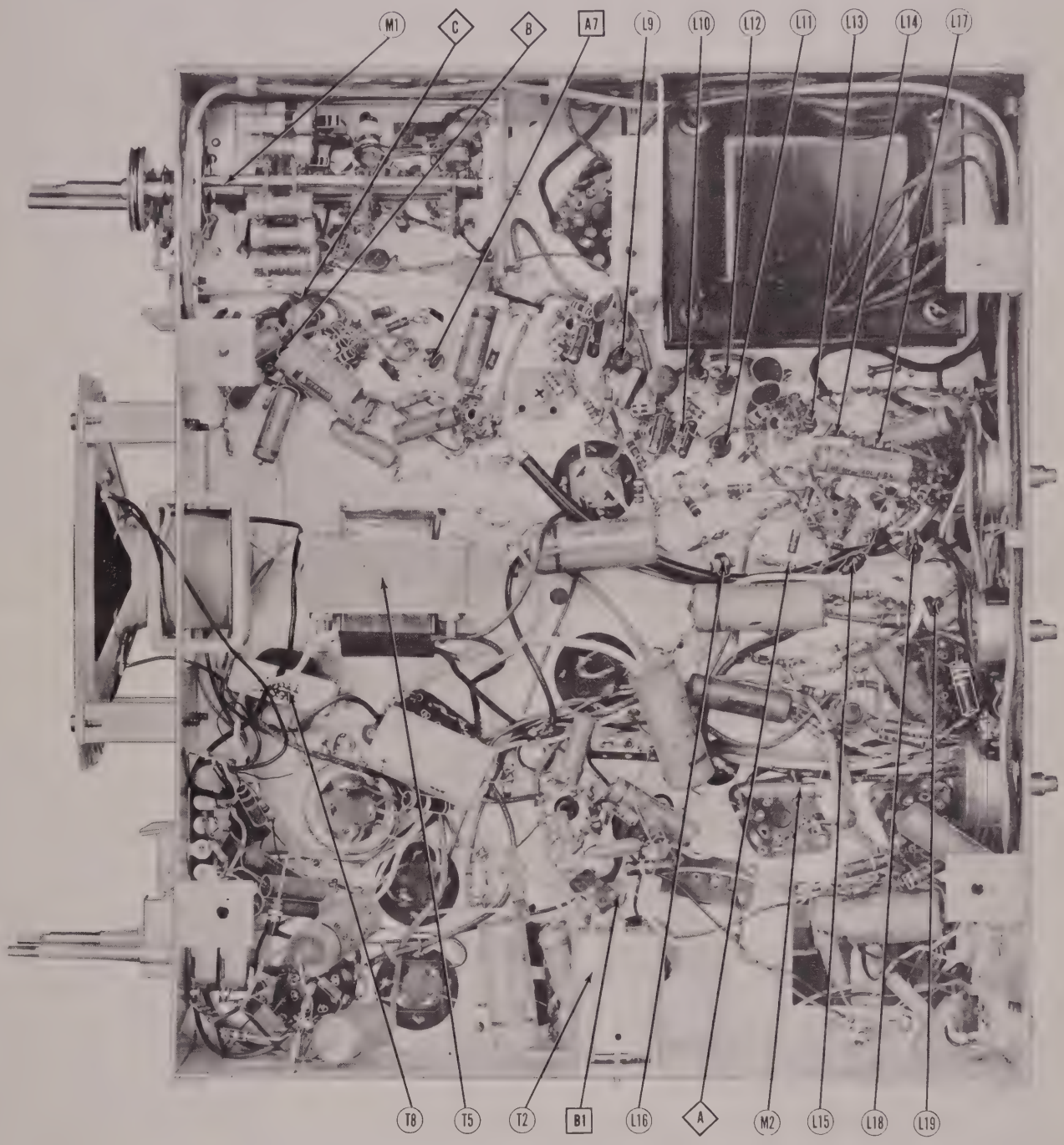


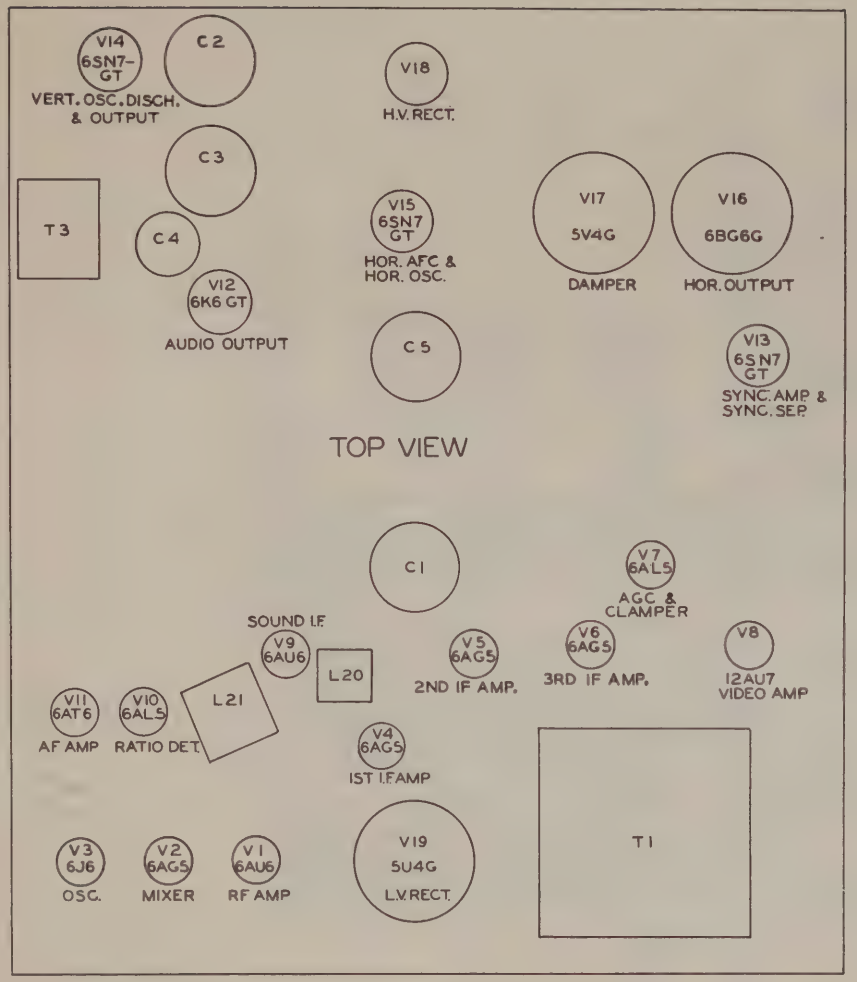
SILVERTONE MODEL
9131 (Ch. 478.210)

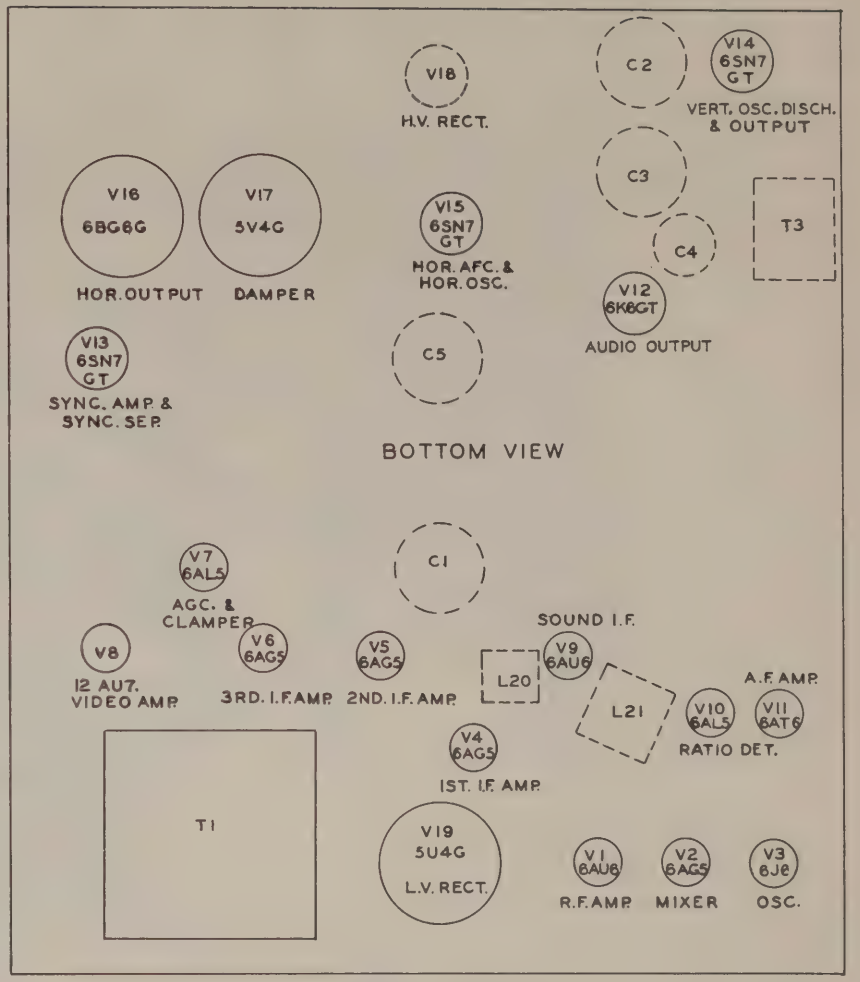


CHASSIS TOP VIEW

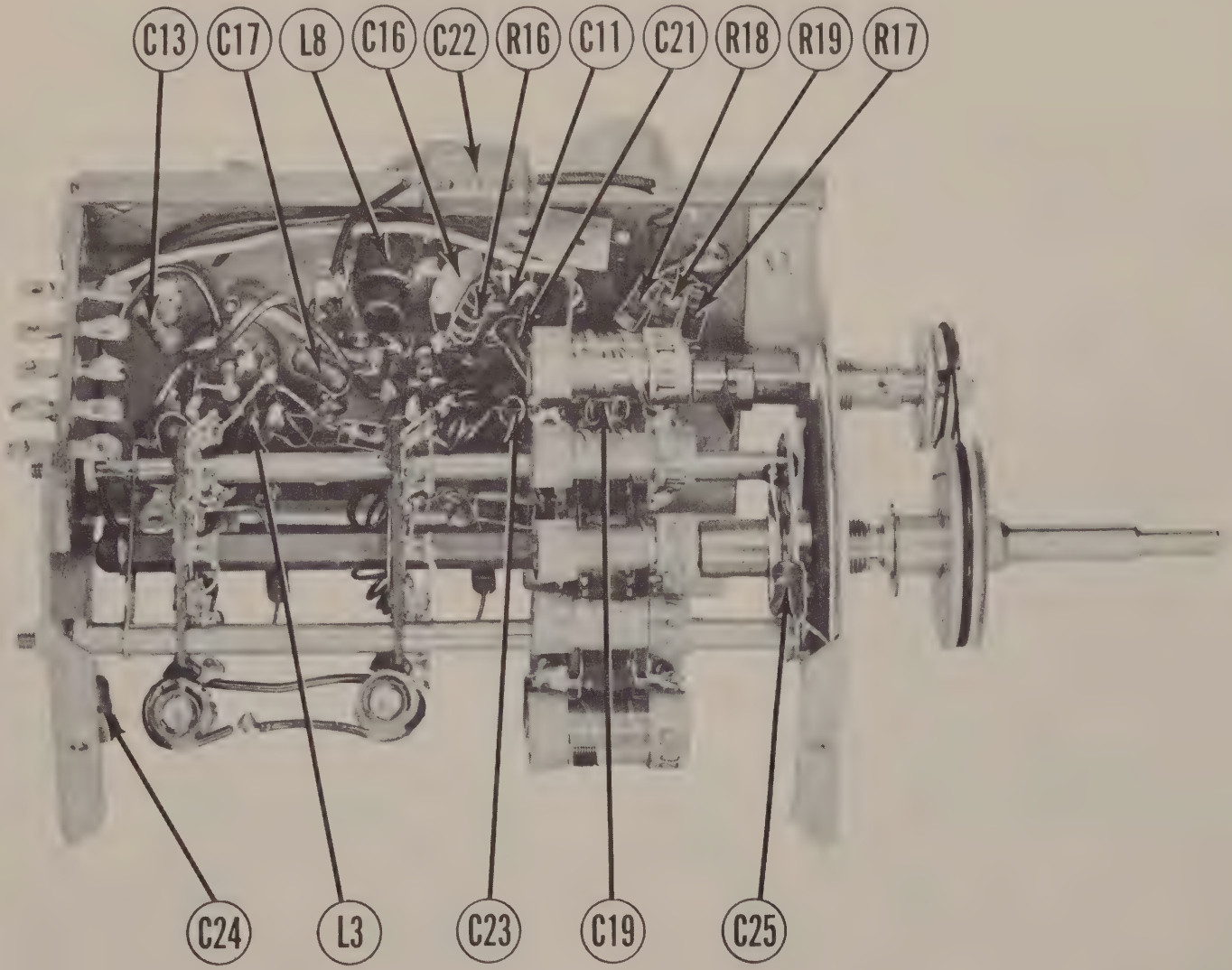


CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART



RF TUNER-LEFT SIDE

RF TUNER-RIGHT SIDE

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
V 1	6AU6	-.2VDC	0V.	6.5VAC	0V.	125VDC	125VDC	.5VDC	-	-
V 2	6AG5	-1.8VDC	0V.	6.5VAC	0V.	122VDC	122VDC	0V.	-	-
V 3	6J6	112VDC	110VDC	6.5VAC	0V.	-4.2VDC§	-4.7VDC§	.4VDC	-	-
V 4	6AG5	-.5VDC	.3VDC	6.5VAC	0V.	120VDC	118VDC	.3VDC	-	-
V 5	6AG5	-.5VDC	0V.	6.5VAC	0V.	127VDC	127VDC	0V.	-	-
V 6	6AG5	0V.	1VDC	6.5VAC	0V.	118VDC	118VDC	1VDC	-	-
V 7	6AL5	.2VDC	0V.	0V.	6.5VAC	0V.	0V.	-.1VDC	-	-
V 8	12AU7	112VDC	-.7VDC	0V.	6.5VAC	6.5VAC	60VDC	-80VDC	-80VDC	PIN #9 0V.
V 9	6AU6	0V.	0V.	6.5VAC	0V.	118VDC	118VDC	.7VDC	-	-
V 10	6AL5	.1VDC	-.1VDC	6.5VAC	0V.	.1VLC	0V.	.1VDC	-	-
V 11	6AT6	-.3VDC	0V.	0V.	6.5VAC	0V.	0V.	65VDC	-	-
V 12	6K6GT	0V.	6.5VAC	195VDC	200VLC	-10VDC	-13.5VDC	0V.	0V.	-
V 13	6SN7GT	-.6VDC	125VDC	0V.	-.3VDC	225VDC	10VDC	6.5VAC	0V.	-
V 14	6SN7GT	-80VDC	-1.4VDC -38VDC	-84VDC	-65VDC	205VDC	-65VDC -70VDC	6.5VAC	0V.	-
V 15	6SN7GT	-68VDC	60VDC	-75VDC	-135VDC	65VDC	-84VDC	6.5VAC	0V.	-
V 16	6BG6G	0V.	6.5VAC	-75VDC	0V.	-80VDC	0V.	0V.	175VDC	†
V 17	5V4G	0V.	340VDC	340VDC	270VDC	0V.	270VDC	0V.	340VDC	-
V 18	1B3GT	†DO NOT MEASURE.								
V 19	5U4G	0V.	270VDC	0V.	370VAC	0V.	370VAC	0V.	270VDC	-

		PINS 1	2	3	4	5	6	7	8	9	10	11	12
V 20	10BP4	130VDC	60VDC	-	-	-	0V.	0V.	-	-	320VDC	40VDC	130VDC

†DO NOT MEASURE
§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
V 1	6AU6	1.5 Meg.	0Ω	.2Ω	0Ω	2.3KΩ*	2.3KΩ*	100Ω	-	-
V 2	6AG5	1 Meg.	0Ω	.2Ω	0Ω	2.3KΩ*	2.3kΩ*	0Ω	-	-
V 3	6J6	1.3KΩ*	1.3KΩ*	.2Ω	0Ω	27KΩ	27KΩ	47Ω	-	-
V 4	6AG5	690KΩ	39Ω	.2Ω	0Ω	2.3KΩ*	2.3KΩ*	39Ω	-	-
V 5	6AG5	700KΩ	39Ω	.2Ω	0Ω	2.3KΩ*	2.3KΩ*	39Ω	-	-
V 6	6AG5	0Ω	100Ω	.2Ω	0Ω	2.3KΩ*	2.3KΩ*	100Ω	-	-
V 7	6AL5	12KΩ	3.9 Meg.	0Ω	.2Ω	0Ω	0Ω	120KΩ	-	-
V 8	12AU7	5KΩ*	1 Meg.	0Ω	.2Ω	.2Ω	5.5KΩ*	1 Meg.	800Ω	PIN #9 0Ω
V 9	6AU6	1.2Ω	0Ω	.2Ω	0Ω	2.3KΩ*	2.3KΩ*	80Ω	-	-
V 10	6AL5	15KΩ	15KΩ	.2Ω	02Ω	INF.	0Ω	INF.	-	-
V 11	6AT6	10 Meg.	0Ω	0Ω	.2Ω	0Ω	0Ω	330KΩ*	-	-
V 12	6K6GT	INF.	.2Ω	1.8KΩ*	1.2KΩ*	470KΩ	130Ω	0Ω	0Ω	-
V 13	6SN7GT	1 Meg.	17KΩ*	0Ω	3.9 Meg.	300Ω*	6.8KΩ	.2Ω	0Ω	-
V 14	6SN7GT	1 Meg.	2.8 Meg.* 1.4 Meg.*	750Ω	2.2 Meg.	1.8KΩ*	6KΩ 1.3KΩ	.2Ω	0Ω	-
V 15	6SN7GT	700KΩ	180KΩ	240KΩ	180KΩ	500KΩ	750Ω	.2Ω	0Ω	-
V 16	6BG6G	INF.	.2Ω	850Ω	INF.	1 Meg.	INF.	0Ω	4.7KΩ*	450KΩ
V 17	5V4G	INF.	450KΩ	450KΩ	60Ω*	INF.	60Ω*	INF.	450KΩ	-
V 18	1B3GT	INF.	INF.	INF.	INF.	INF.	INF.	INF.	INF.	450KΩ
V 19	5U4G	INF.	10KΩ	INF.	800Ω	INF.	800Ω	INF.	10KΩ	-

		PINS 1	2	3	4	5	6	7	8	9	10	11	12
V 20	10BP4	7.5KΩ	5KΩ*	-	-	-	INF.	INF.	-	-	450KΩ	65KΩ	7.5KΩ

*MEASURED FROM PIN 8 OF V19.

1 - DC Voltage measurements are at 20,000 ohms per volt: AC Voltage measured at 1000 ohms.

2 - Socket connections are shown as bottom views.

3 - Measured values are from socket pin to common negative unless otherwise stated.

4 - Line voltage maintained at 117 volts for voltage readings.

5 - Front panels controls set at maximum.

6 - Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Remove 6J6 Oscillator Tube (V3) while aligning IF system. Short antenna terminals and set contrast control to three quarters of its maximum rotation. An easy method of injecting the signal through the IF system is accomplished by placing a tube shield over the mixer tube but being careful not to ground the shield. Connect the signal generator high side to this tube shield and the low side to a nearly ground point.

VIDEO IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1	Tube Shield	See prealignment instructions	34.45MC (No mod.)	Any	DC probe to Point A. Commor to chassis.	A1,A2	Adjust for maximum deflection.
2	"	"	37.0MC (No Mod.)	"	"	A3,A4	"
3	"	"	32.8MC (No Mod.)	"	"	A5	Adjust for minimum deflection. Readjust A1 at 34.45 MC. Turn off generator. VTVM should read no more than .2 volt. If higher than .2 volt, IF system is not properly aligned.

OVERALL RESPONSE CHECK USING FM SIGNAL GEN. & OSCILLOSCOPE

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4	Tube Shield (See prealignment)	High side to tube shield. Low side to chassis	35MC (10MC sweep)	32.8MC, 34.45MC, 37.0MC & 37.3MC	Any	Vert. Amp. to Point A. Low side to chassis	A1,A2, A3,A4, A5	Observe symmetry of pattern and slightly retouch A1,A2,A3,A4 & A5 to place markers as per Fig. 1, if necessary. (Dotted lines show acceptable variations.)

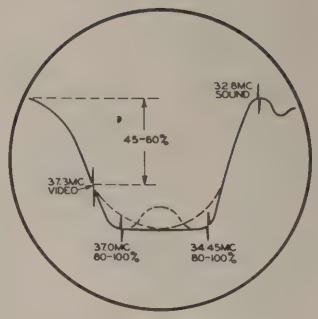


FIG. 1

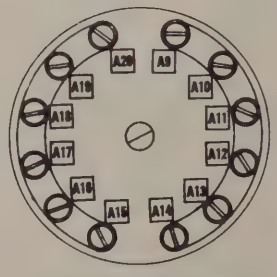
SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5	5000MMF	High side to Pin 7 (Grid) 12AU7 (V8). Low side to chassis	4.5MC (No mod.)	Any	DC probe to Point D. Low side to chassis.	A6,A7	Adjust for maximum output.
6	5000MMF	"	"	"	DC probe to Point D. Low side to chassis	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

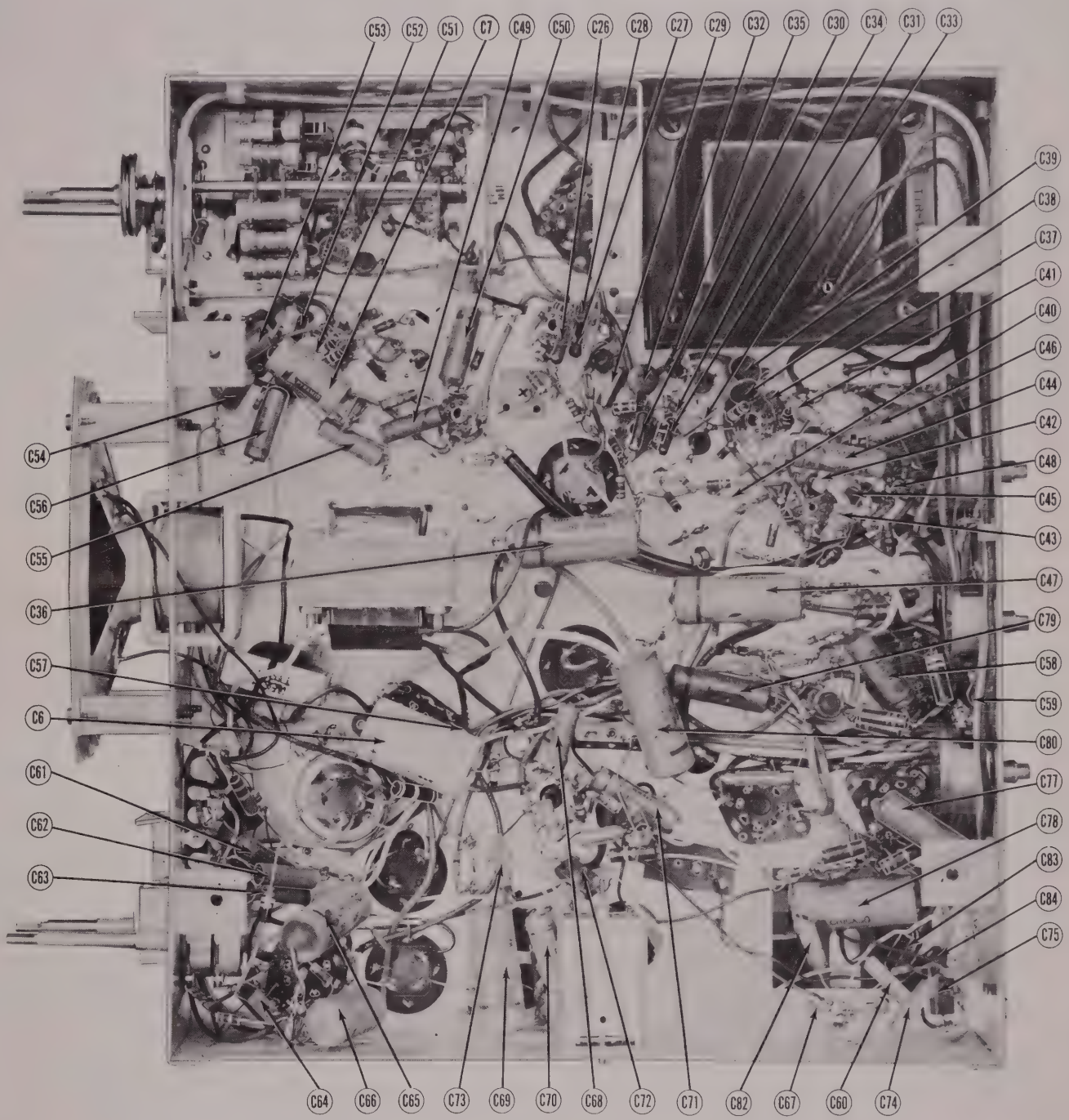
OSCILLATOR ALIGNMENT

The RF Amplifier and Mixer lines are aligned at the factory and are very stable and usually do not require adjustment in the field. Set fine tuning control at the mid-point of its range. It should be noted that Channel 2 Oscillator Coil is in parallel with all other oscillator coils from Channel 3 to 13 as they are switched into the circuit. It therefore is necessary to align Channel 2 first. If Channel 2 is aligned then all other Channels must be aligned.

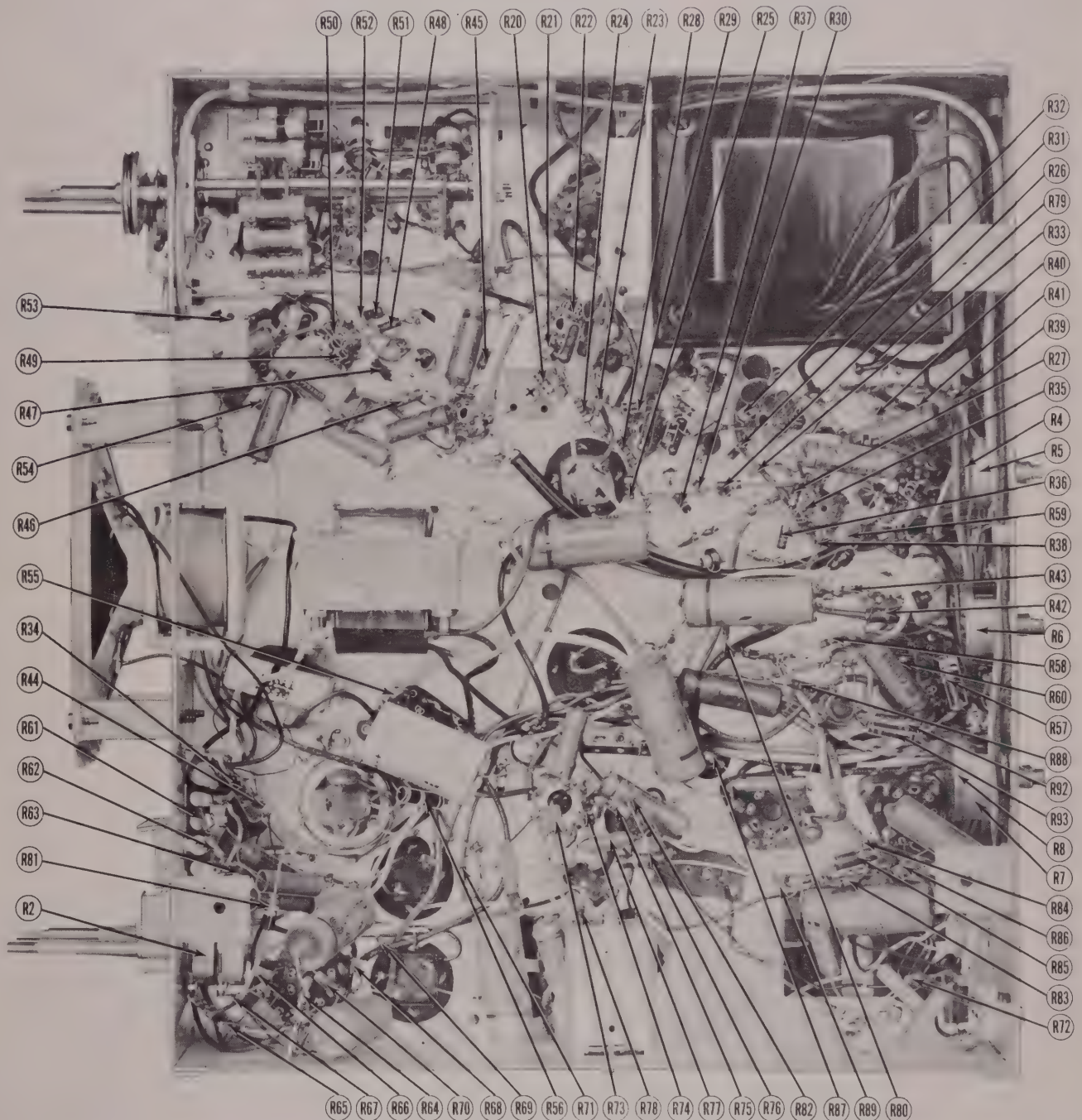
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7	Direct	Across antenna terminals.	57MC (10MC sweep)	55.25MC (Video) 59.75MC (Sound)	2	Vert. Amp. to Point A. Low side to chassis	A9	Adjust until sound marker drops into "notch" in pattern as per Fig. 1. The video marker may vary 45% to 60% up the side of the slope.
8	Direct	"	63MC (10MC sweep)	61.25MC (Video) 65.75MC (Sound)	3	"	A10	"
9	Direct	"	69MC (10MC sweep)	67.25MC (Video) 71.75MC (Sound)	4	"	A11	"
10	Direct	"	79MC (10MC sweep)	77.25MC (Video) 81.75MC (Sound)	5	"	A12	"
11	Direct	"	85MC (10MC sweep)	83.25MC (Video) 87.75MC (Sound)	6	"	A13	"
12	Direct	"	177MC (10MC sweep)	175.25MC (Video) 179.75MC (Sound)	7	"	A14	"
13	Direct	"	183MC (10MC sweep)	181.25MC (Video) 185.75MC (Sound)	8	"	A15	"
14	Direct	"	189MC (10MC sweep)	187.25MC (Video) 191.75MC (Sound)	9	"	A16	"
15	Direct	"	195MC (10MC sweep)	193.25MC (Video) 197.75MC (Sound)	10	"	A17	"
16	Direct	"	201MC (10MC sweep)	199.25MC (Video) 203.75MC (Sound)	11	"	A18	"
17	Direct	"	207MC (10MC sweep)	205.25MC (Video) 209.75MC (Sound)	12	"	A19	"
18	Direct	"	213MC (10MC sweep)	211.25MC (Video) 215.75MC (Sound)	13	"	A20	"



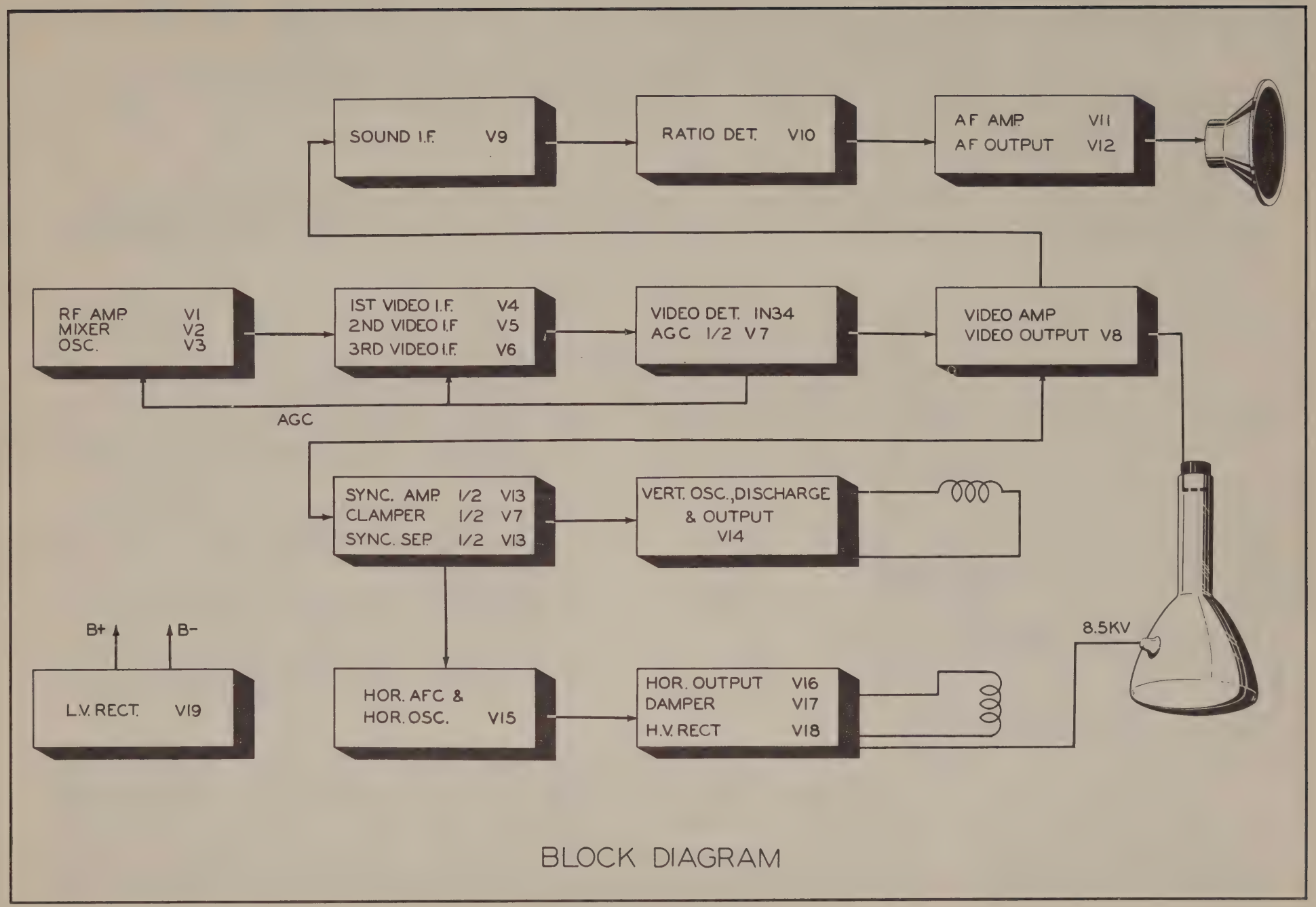
OSC. ALIGNMENT POINTS



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AU6	6AU6	7BK	
V2	Mixer	6AQ5	6AQ5	7BD	
V3	Oscillator	6J6	6J6	7BF	
V4	1st IF Amp.	6AQ5	6AQ5	7BD	
V5	2nd IF Amp.	6AQ5	6AQ5	7BD	
V6	3rd IF Amp.	6AQ5	6AQ5	7BD	
V7	AGC & Clamper	6AL5	6AL5	6BT	
V8	Video Amp. & Video Output	12AU7	12AU7	9A	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amp.	6AT6	6AT6	7BT	
V12	Audio Output	6K6GT	6K6GT	7S	
V13	Sync. Amp. Sync. Sep.	6SN7GT	6SN7GT	8BD	
V14	Vert. Osc. & Discharge, Vert. Output	6SN7GT	6SN7GT	8BD	
V15	Hor. Osc.	6SN7GT	6SN7GT	8BD	
V16	Hor. Output	6BQ6G	6BQ6G	8BT	
V17	Damper	5V4G	5V4G	5L	
V18	H.V. Rectifier	1B3GT	1B3GT	3C	
V19	L.V.	5U4G	5U4G	5T	
V20	Picture Tube	10BP4	10BP4		

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	TCE-116-D					◓ Filter
B	10	350						▲ Vert. Output Decoup.
C2A	40	450	TCE-117-D					◓ Filter
B	40	150						■ Bias Filter
C	130	50						▲ Vert. Cath. Bypass
C3A	80	450	TCE-113-D					◓ Filter
B	10	450						▲ Decoupling
C4A	10	450	TCE-115-D					◓ "
B	30	400						■ Filter
C	30	300						▲ "
C5A	1000	6	TCE-114-D					▲ Vert. Cent. Bypass
B	250	10						◓ Hor. Cent. Bypass
C6	24	300	TCE-112-D	PRS350/24	BR2045	M-20-350	UT-203	S. Output Decoupling
C7	4	25	TCE-104-D	PRS150/4	BR415	M-4-450	UT-41	Stabilizing Cap.
C8	360	500	TCC-501-10					Ant. Coupling-Note1 Cer.
C9	360	500	TCC-501-10					" " " "
C10	360	500	TCC-501-10					RF Coupling-Note 2 " "
C11	360	500	TCC-501-10					AVC Filter " "
C12	360	500	TCC-501-10					RF Screen Byp. " "
C13	300	500	TCC-501-10					RF Fil. Byp. " "
C14	.82		TCC-0.82-SP					RF Coupling " "
C15	22		TCC-22-12					" " "
C16	5000	600	TCC-502-SP					Mixer Decoup. "
C17	300	500	TCC-501-10					Mixer Fil. Byp. " Note 2
C18	1.5		TCC-1.0-11					Osc. Coupling "
C19	4.7		TCC-407-11					Osc. Feedback "
C20	4.7		TCC-407-11					" " "
C21	300	500	TCC-501-10					Osc. Fil. Byp.Note 3"
C22	270	500	TCM-271-13	1468-00025	5W5T25	M0.5-325	1FM-325	IF Coupling "
C23	360	500	TCC-501-10					Decoupling-Note 2 "
C24	360	500	TCC-501-10					Tuner Switch Iso. Note 3 "
C25	360	500	TCC-501-10					" " "
C26	1500	600	TCC-152-10	1467-0015	1W5D15	MW.5-215	1FM-215	AGC Filter "
C27	1500	600	TCC-152-10	1467-0015	1W5D15	MW.5-215	1FM-215	1st IF Decoupling "
C28	5000	600	TCC-502-SP	1467-005	1D5D5	MW.5-25	1FM-25	1st IF Fil. Byp. "
C29	270	500	TCM-271-13	1468-00025	5W5T25	M0.5-325	1FM-325	IF Coupling "
C30	1500	600	TCC-152-10	1467-0015	1W5D15	MW.5-215	1FM-215	AGC Filter "
C31	1500	600	TCC-152-10	1467-0015	1W5D15	MW.5-215	1FM-215	2nd IF Decoupling "
C32	5000	600	TCC-502-SP	1467-005	1D5D5	MW.5-25	1FM-25	2nd IF Fil. Byp. "
C33	270	500	TCM-271-13	1468-00025	5W5T25	M0.5-325	1FM-325	IF Coupling "
C34	1.5		TCC-1.5-11					" " "
C35	30	500	TCC-030-11					Fixed Trimmer
C36	.25	400	TCP-254-4	P488-25	GT4P25	ST-4-25	TC-2	AGC Filter
C37	1500	600	TCC-152-10	1467-0015	1W5D15	MW.5-215	1FM-215	3rd IF Decoupling "
C38	5000	600	TCC-502-SP	1467-005	1D5D5	MW.5-25	1FM-25	3rd IF Cath. Byp. "
C39	5000	600	TCC-502-SP	1467-005	1D5D5	MW.5-25	1FM-25	3rd IF Fil. Byp. "
C40	5000	600	TCC-502-SP	1467-005	1D5D5	MW.5-25	1FM-25	Decoupling "
C41	270	500	TCM-271-13	1468-00025	5W5T25	M0.5-325	1FM-325	IF Coupling "
C42	470	600	TCC-471-10	1468-0005	5W5T5	M0.5-35	1FM-35	IF Coupling "
C43	5000	600	TCC-502-SP	1467-005	1D5D5	MW.5-25	1FM-25	Bias Filter "
C44	.05	400	TCP-503-4	P488-05	GT4S5	ST-4-05	TM-15	Video Coupling "
C45	5		TCC-050-11	1469-000005	5R5V5	M0S.5-55	MS-55	Fixed Trimmer "
C46	.05	400	TCP-503-4	P488-05	GT4S5	ST-4-05	TM-15	Video Coupling
C47	.25	400	TCP-254-4	P488-25	GT4P25	ST-4-25	TC-2	Picture Cath. Bypass "
C48	2.2		TCC-2.2-11					Sound Coupling "
C49	.01	400	TCP-103-4	P488-01	GT4S1	ST-4-01	TM-11	Sound IF Decoupling
C50	.02	400	TCP-203-4	P488-02	GT4S2	ST-4-02	TM-12	S. Cath. Bypass
C51A	2000		TCC-2-1	1467-002	1W5D2	MW.5-22	1FM-22	Diode Load Cap. " Note 6
B	2000			1467-002	1W5D2	MW.5-22	1FM-22	" " "
C52	1500		TCC-152-10	1467-0015	1W5D15	MW.5-15	1FM-215	De-emphasis
C53	.01	400	TCP-103-4	P488-01	GT4S1	ST-4-01	TM-11	Audio Coupling-Note4
C54	.002	600	TCP-202-10	P688-002	GT6D2	ST-6-002	TM-22	Note 5
C55	.002	600	TCP-202-10	P688-002	GT6D2	ST-6-002	TM-22	AF Plate Bypass
C56	.01	400	TCP-103-4	P488-01	GT4S1	ST-4-01	TM-11	Audio Coupling
C57	.005	600	TCP-502-10	P688-005	GT6D5	ST-6-005	TM-25	Output Plate Bypass
C58	.05	400	TCP-503-4	P488-05	GT4S5	ST-4-05	TM-15	Video Coupling
C59	100	500	TCM-101-7	1468-0001	5W5T1	M0.5-31	1FM-31	Sync. Coupling
C60	390	500	TCM-391-14	1468-0004	5W5T4	M0.5-34	1FM-34	Sync. Amp. Cath. Byp.
C61	.002	600	TCP-103-4	P688-002	GT6D2	ST-6-002	TM-22	Integrator Network
C62	.005	400	TCP-502-4	P488-005	GT6D5	ST-4-005	TM-25	" "
C63	.005	400	TCP-502-4	P488-005	GT6D5	ST-4-005	TM-25	" "
C64	4700	500	TCM-472-9	1464-005	1D5D5	MW.5-25	1FM-25	Vert. Osc. Grid
C65	.25	400	TCP-254-4	P488-25	GT4P25	ST-4-25	TC-2	Vert. Coupling
C66	.1		10XTCP-104-13	1064-1	TVC10P1	STM-10-1	PX-11	Vert. Discharge
C67	120	500	TCM-121-8					Sync. Coupling

CAPACITORS (CONT.)

C68	.002	600	TCP-202-10	P688-002	GT6D2	ST-6-002	TM-22	" "
C69	.25	400	TCP-254-4	P488-25	GT4P25	ST-4-25	TC-2	AFC Filter
C70	.02	400	TCP-203-4	P488-02	GT4S2	ST-4-02	TM-12	" "
C71	.05	400	TCP-503-4	P488-05	GT4S5	ST-4-05	TM-15	AFC Plate Bypass
C72	180	500	TCM-181-29					Hor. Osc. Grid ±2 %
C73	2200	500	TCM-222-15					Hor. Osc. Decoup.±5%
C74	390	500	TCM-391-14	1469-0004	5R5T4	M0S.5-34	MS-34	Hor. Coupling
C75	120	500	TCM-121-8					Fixed Trimmer ±10%
C76	47	600	TCM-047-23					" " -Note 3
C77	.05	600	TCP-503-10	P698-05	GT6S5	ST-6-05	TM-15	Hor. Output Screen Byp.
C78	.25	400	TCP-254-4	P488-25	GT4P25	ST-4-25	TC-2	Hor. Output. Cath. Byp.
C79	.035	600	TCP-353-10					Damper Filter
C80	.1	1000	TCP-104-13	1084-1	TVC10P1	STM-10-1	PX-11	" "
C81	500	1000	TCM-501-SP					H.V. Filter
C82	5	150	TCM-050-20					AFC Feedback
C83	.01	400	TCPM-103-4	P488-01	GT4S1	MPH-6-01	TM-11	Line Filter
C84	.01	400	TCPM-103-4	P488-01	GT4S1	MPH-6-01	TM-11	" "

Note 1-Some models use 5000 MMF in this application.
Note 2-Some models use 500 MMF in this application.
Note 3-Not used in all models.
Note 4-Some models use .002 MFD in this application.
Note 5-Some models use .01 MFD in this application.
Note 6-When either Item C51A or C51B are replaced, replace both with capacitors of equal value.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	10KΩ	½		B11-116*		Contrast Control - Panel
B	500KΩ	½	TVC-500-D	B11-133*		Brightness Control - Rear
C	Shaft End			E187*		Attach per instructions in "Concentrikit"
R2A	1 Meg.	½		B11-137*		Vert. Hold Control - Panel
B	50KΩ	½	TVC-501-D	B11-123*		Horiz. Hold Control - Rear
C	Shaft End			E187*		Attach per instructions in "Concentrikit".
R3A	1 Meg.	½	TVC-502-D	M-63-Z	D13-137	Volume Control
B	Shaft		Not Reg.	Not Reg.	A	Attach to R3A per instructions
C	Switch		TVC-503-D	SW-A	41	" " " "
R4A	500Ω	½	TVC-503-D	M-19-S	D11-114	Vertical Linearity Control
B	Shaft		Not Reg.	Not Reg.	A	Attach to R4A per instructions
R5A	2.5 Meg.	½	TVC-504-D			Height Control
B	Shaft		Not Reg.			Attach to R5A per instructions
R6	20Ω	2	TVC-505-D		W20A10	Vertical Centering tapped @ 10Ω
R7	20Ω	2	TVC-507-D	43-20	W-20	Horizontal Centering
R8	2250Ω	4	TVC-506-D	58-3000	W-3000	Focus

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE 10% TOL. UNLESS OTHERWISE SPECIFIED	
R9	470Ω	½	TRC472-3		Yl.-Vi.-Red RF Coil Shunt	±5%
R10	1000Ω	½	TRC102-1	BTS-1000	Br.-Blk.-Red RF Screen	±20%
R11	100Ω	½	TRC101-3		Br.-Blk.-Br. RF Cathode	±5%
R12	1 Meg.	½	TRC105-3	BTS-1 Meg.	±5% Br.-Blk.-Grn. RF Grid	±5%
R13	1000Ω	½	TRC102-3	BTS-1000	±5% Br.-Blk.-Red Antenna Coil Shunt*	±5%
R14	470Ω	½	TRC472-3		Yl.-Vi.-Red Mixer Coil Shunt	±5%
R15	1 Meg.	½	TRC105-3	BTS-1 Meg.	±5% Br.-Blk.-Grn. Mixer Grid	±5%
R16	1000Ω	½	TRC102-1	BTS-1000	Br.-Blk.-Red Mixer Decoupling	±20%
R17	47Ω	½	TRC470-1		Yl.-Vi.-Blk. Oscillator Cathode	±20%
R18	27KΩ	½	TRC273-1	BTS-27K	Red-Vi.-Or. Oscillator Grid	±20%
R19	27KΩ	½	TRC273-1	BTS-27K	Red-Vi.-Or. " "	±20%
R20	330Ω	½	TRC331-2		Or.-Or.-Br. AGC Network	
R21	5600Ω	½	TRC562-3		Grn.-Blue-Red IF Grid	±5%
R22	39Ω	½	TRC390-2		Or.-White-Blk. IF Cathode	
R23	1000Ω	½	TRC102-1	BTS-1000	Br.-Blk.-Red IF Decoupling	±20%
R24	330Ω	½	TRC331-2		Or.-Or.-Br. AGC Network	
R25	330Ω	½	TRC331-2		Or.-Or.-Br. " "	
R26	560KΩ	½	TRC564-2	BTS-560K	Grn.-Blue-Yl. " "	
R27	120KΩ	½	TRC124-2	BTS-120K	Br.-Red-Yl. Diode Load	
R28	15KΩ	½	TRC153-3		Br.-Grn.-Or. 2nd IF Grid	±5%
R29	39Ω	½	TRC390-2		Or.-White-Blk. 2nd IF Cathode	
R30	1000Ω	½	TRC102-1	BTS-1000	Br.-Blk.-Red 2nd IF Decoupling	±20%
R31	10KΩ	½	TRC103-2		Br.-Blk.-Or. 3rd IF Grid	±5%
R32	100Ω	½	TRC101-2		Br.-Blk.-Br. 3rd IF Cathode	
R33	1000Ω	½	TRC102-1	BTS-1000	Br.-Blk.-Red 3rd IF Decoupling	±20%
R34	120KΩ	1	TRC124-5	BTA-120K	Br.-Red-Yl. Voltage Divider	
R35	1500Ω	½	TRC152-1	BTS-1500	Br.-Grn.-Red Bias Filter	±20%
R36	5600Ω	½	TRC562-3	BTS-5600	±5% Grn.-Blue-Red Video Detector Load	±5%
R37	3300Ω	½	TRC332-3	BTS-3300	±5% Or.-Or.-Red " "	±5%
R38	1 Meg.	½	TRC105-3	BTS-1 Meg.	±5% Br.-Blk.-Grn. 1st Video Grid	±5%
R39	3300Ω	½	TRC332-2	BTS-3300	Or.-Or.-Red Video Amplifier Plate Load	±20%
R40	1 Meg.	½	TRC105-3	BTS-1 Meg.	±5% Br.-Blk.-Grn. Video Output Grid	±5%
R41	47Ω	½	TRC470-1		Yl.-Vi.-Blk. Video Output Cathode	±20%
R42	3300Ω	1	TRC332-5	BTA-3300	Or.-Or.-Red Video Output Plate	
R43	1000Ω	½	TRC102-1	BTS-1000	Br.-Blk.-Red Video Output Plate	±20%
R44	100KΩ	½	TRC104-2	BTS-100K	Br.-Blk.-Yl. Voltage Divider	
R45	82Ω	½	TRC820-2		Gray-Red-Blk. Sound IF Cathode	
R46	1200Ω	½	TRC122-1	BTS-1200	Br.-Red-Red Sound IF Decoupling	±20%
R47	220Ω	½	TRC221-1		Red-Red-Br. Balancing	±20%
R48	220Ω	½	TRC221-1		Red-Red-Br. "	±20%
R49	15KΩ	½	TRC153-3	BTS-15K	±5% Br.-Grn.-Or. Ratio Detector Diode Load	±5%
R50	15KΩ	½	TRC153-3	BTS-15K	±5% Br.-Grn.-Or. Ratio Detector Diode Load	±5%
R51	5.1Ω	½	TRC51A-2		Grn.-Br.-Gold Filament String	
R52	47KΩ	½	TRC473-1	BTS-47K	Yl.-Vi.-Or. De-emphasis	±20%
R53	10 Meg.	½	TRC106-1	BTS-10 Meg.	Br.-Blk.-Blue AF Grid	±20%
R54	330KΩ	½	TRC334-1	BTS-330K	Or.-Or.-Yl. AF Plate	±20%
R55	470KΩ	½	TRC474-1	BTS-470K	Yl.-Vi.-Yl. Output Grid	±20%
R56	1000Ω	1	TRC102-4	BTA-1000	Br.-Blk.-Red Filter	±20%
R57	15KΩ	1	TRC153-4	BTA-15K	Br.-Grn.-Or. Sync. Amplifier Plate	±20%
R58	1 Meg.	½	TRC105-1	BTS-1 Meg.	Br.-Blk.-Grn. Sync. Amplifier Grid	±20%
R59	3.9 Meg.	½	TRC395-2	BTS-3.9 Meg.	Or.-White-Grn. Sync Seperator Grid	
R60	680Ω	½	TRC682-1	BTS-680Ω	Blue-Gray-Red Sync. Seperator Cathode	±20%
R61	22KΩ	½	TRC223-1	BTS-22K	Red-Red-Or. Integrator Network	±20%
R62	820Ω	½	TRC822-2	BTS-820Ω	Gray-Red-Red " "	
R63	820Ω	½	TRC822-2	BTS-820Ω	Gray-Red-Red " "	
R64	1.5 Meg.	½	TRC155-2	BTS-1.5 Meg.	Br.-Grn.-Grn. Vert. Osc. Plate	
R65	6.8 Meg.	½	TRC685-2	BTS-6.8 Meg.	Blue-Gray-Grn. Voltage Divider	

RESISTORS (CONT.)

R66	100KΩ	½	TRC104-2	BTS-100K	Br.-Blk.-Yl. " "	
R67	1 Meg.	½	TRC105-3	BTS-1 Meg.	±5% Br.-Blk.-Grn. Vertical Oscillator Grid	±5%
R68	560Ω	½	TRC561-2	BTS-560	Grn.-Blue-Br. Vertical Output Cathode	
R69	2.2 Meg.	½	TRC225-1	BTS-2.2 Meg.	Red-Red-Grn. Vertical Output Grid	±20%
R70	330Ω	½	TRC332-2	BTS-3300	Or.-Or.-Red Peaking	±20%
R71	1000Ω	½	TRC102-1	BTS-1000	Br.-Blk.-Red Filter	±20%
R72	150KΩ	½	TRC154-2	BTS-150K	Br.-Grn.-Yl. AFC Feedback	
R73	3.3 Meg.	1	TRC335-6	BTS-3.3 Meg.	±5% Or.-Or.-Grn. Voltage Divider	±5%
R74	560KΩ	½	TRC564-3	BTS-560K	±5% Grn.-Blue-Yl. Horizontal AFC Grid	±5%
R75	180KΩ	½	TRC184-2	BTS-180K	Br.-Gray-Yl. Horizontal AFC Cathode	
R76	100KΩ	1	TRC104-6	BTA-100K	±5% Br.-Blk.-Yl. Voltage Divider Network	±5%
R77	100KΩ	½	TRC104-SP		" " Horizontal Oscillator Grid	±1%
R78	10KΩ	½	TRC103-2	BTS-10K	Br.-Blk.-Or. Horizontal Oscillator Coil Shunt	±20%
R79	30KΩ	½	TRC303-12		Voltage Divider Network	
R80	120KΩ	½	TRC124-2	BTS-120K	Br.-Red-Yl. " " "	
R81	270KΩ	½	TRC274-2	BTS-270K	Red-Vi.-Yl. " " "	
R82	120KΩ	1	TRC124-2	BTA-120K	Br.-Red-Yl. Horizontal Oscillator Plate	
R83	1 Meg.	½	TRC105-3	BTS-1 Meg.	±5% Br.-Blk.-Grn. Horizontal Output Grid	±5%
R84	47Ω	1	TRC470-1		Yl.-Vi.-Blk. Parasitic Suppressor	±20%
R85	82Ω	1	TRC820-5		Gray-Red-Blk. Horizontal Output Cathode	
R86	4700Ω	1	TRC472-5	BTA-4700	Yl.-Vi.-Red Horizontal Output Screen	
R87	10KΩ	½	TRC103-2	BTS-10K	Br.-Blk.-Or. Decoupling	
R88	56KΩ	½	TRC563-2	BTS-56K	Grn.-Blue-Or. Voltage Divider	
R89	560KΩ	½	TRC564-2	BTS-560K	Grn.-Blue-Yl. AFC Feedback	
R90	3Ω				Or.-Blk.-Gold Filament String	±5%
R91	1 Meg.	1	TRC105-4	BTA-1 Meg.	Br.-Blk.-Grn. H.V. Filter	±20%
R92	680Ω	1	TRC681-4	BTA-680	Blue-Gray-Br. Series Focus Control	±20%
R93	680Ω	1	TRC681-4	BTA-680	Blue-Gray-Br. " " "	±20%
R94A	1125Ω	20	TRP-1		Voltage Divider	
B	610Ω	20			" "	
R95	39Ω	1	TRC390-5	BW-1-39	Or.-White-Blk. " "	
R96A	82ΩΩ	5			" "	
B	35Ω	8	TRP-2	A6-35	" "	
C	100Ω	2		BW-2-100	" "	

*Part of L2.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
T1	117V AC @ 1.88A	740V AC CT @ .230A SEC. 4 6.4V AC @ 6.5A	5V AC @ 3A SEC. 5 6.4V AC @ .6A	5V AC @ 2A	TTR105			P-3059

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.	NOTES
T2	150Ω tap @ 41Ω						Hor. Osc. Trans.
			TTR157				
T3	1310Ω	165Ω	TTR152	A-8111	TV24A88	A-3000	Vert. Block. Osc.
T4	420Ω tap @ 180Ω	SEC. 1 10.6Ω tap. @ .6Ω SEC. 2 0Ω	TTR154				Hor. Output Trans.
T5	590Ω	7Ω	TTR153	A-8115	TV24B86	A-3035	Vert. Output Trans.
T6A	14Ω		TTR159-D	DY-1			Hor. Deflec. Yoke
B	63Ω						Vert. Deflec. Yoke
T7	245Ω		TLF507	FC-10			Focus Coil

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
T8	7100Ω	3.4Ω	360Ω	.3Ω	TTR156	A-3878	T22S47	A-2931	

SPEAKER

ITEM No.	RATING: FIELD. RES.	RATING: V. C. IMP.	REPLACEMENT DATA: SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	5Ω	3.4Ω				
SP1B	PM					Alternate Speaker
	CONE DIA.	V. C. DIA.				
SP2A	4"x6"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~A)	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.	INSTALLATION NOTES
L1				TTR106-D				Not used in all models.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	MEISSNER PART No.	NOTES
L2	Ant. Input Coil	.22CT		TLF-139-D		
L3	RF Strap Inductor	0Ω		TLF-138-D		
L4	RF End Ind.	0Ω		TLF-143-D		
L5	" "	0Ω		TLF-143-D		
L6	RF Plate Ch.	0Ω		TLF-140-D		

SILVERTONE MODEL 9131 (Ch. 478.210)

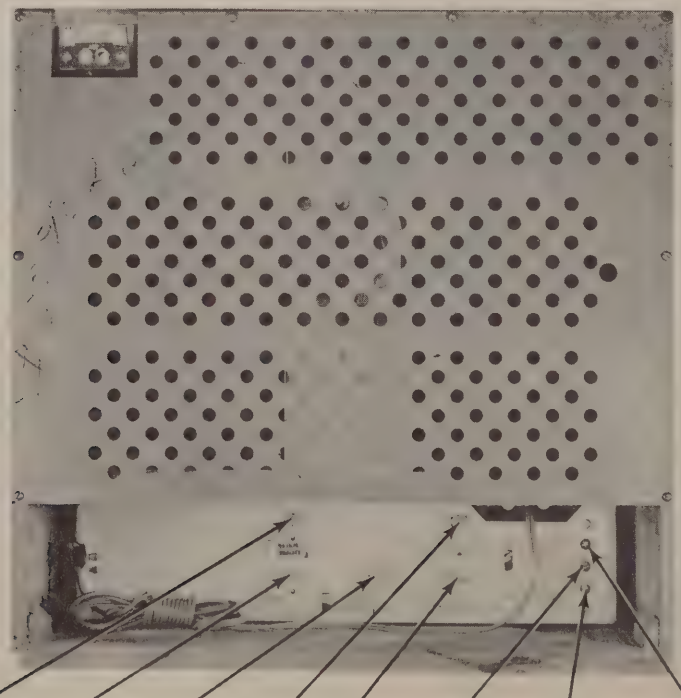
PARTS LIST AND DESCRIPTIONS (Continued)

COILS (CONT.)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L7A	Osc. Coils	0Ω		TLF-120-1D		Channel #2
B	" "	0Ω		TLF-120-2D		" #3
C	" "	0Ω		TLF-120-3D		" #4
D	" "	0Ω		TLF-120-4D		" #5
E	" "	0Ω		TLF-120-5D		" #6
F	" "	0Ω		TLF-120-6D		" #7
G	" "	0Ω		TLF-120-7D		" #8
H	" "	0Ω		TLF-120-8B		" #9
I	" "	0Ω		TLF-120-9D		" #10
J	" "	0Ω		TLF-120-10D		" #11
K	" "	0Ω		TLF-120-10D		" #12
L	" "	0Ω		TLF-120-10D		" #13
L8	IF Coil	.1Ω		TLF-147-D		
L9	1st VideoIF	.1Ω		TLF-147-D		
L10	IF Plate Ck.	2Ω		TLF-146-D		
L11	2nd VideoIF	.1Ω		TLF-148-D		
L12	Sound Trap	0Ω		TTR-158		
L13	IF Plate Chk.	2Ω		TLF-146-D		
L14	3rd VideoIF	.1Ω		TLF-149-D		
L15	Peaking Coil	3Ω		TLF-503		36 Microhenries
L16	" "	7Ω		TLF-504		180 Microhenries - Wound on 39KΩ resistor
L17	" "	6Ω		TLF-502		120 Microhenries - Wound on 22KΩ resistor
L18	" "	3Ω		TLF-503		36 Microhenries
L19	" "	6Ω		TLF-502		120 Microhenries - Wound on 22KΩ resistor
L20	Sound Take-off Trap	1.5Ω		TLF-114-D		
L21	Ratio Det.	4Ω		TLF-142-D		
L22	Width Cont.	.5Ω		TLF-505		
L23	Horiz. Linearity	34Ω		TLF-506		

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Bandswitch	TSW-102D	
M2	Fuse	TFU-1	AGC - 1/4 Amp.-250Volts
M3	Ion Trap Assembly	TLF-500	
	Anode connector and lead	TFA-2	Picture Tube
	Escutcheon	TMS-121-D	
	Safty Glass	TGL-101-D	
	Knob	TKN-100	Outside
	"	TKN-101	Inside (Small shaft)
	"	TKN-103	Inside (Large shaft)
	"	TKN-108	Inside (Large Shaft - Engraved Dot)
B1,B3, B5	Trimmer Strip Assembly	TAS501-D	Horiz. Freq.,Horiz. Locking and Horiz. Drive.
	Cabinet	TCB258-D	
	Cabinet Back	TBK159-D	
	Interlock Cord	TLD101	



CABINET-REAR VIEW

HORIZONTAL AND VERTICAL SWEEP ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT CHECK:

Tune in test pattern and turn horizontal hold control to extreme counter-clockwise position. Picture should remain in synchronization. Turn channel switch to another channel and then back to the original channel. Normally, the picture should be out of synchronization. Turn the control clockwise and the picture should slowly begin to synchronize and finally lock-in. This should occur when the control is approximately 90° from the extreme counter-clockwise position. The picture should remain in synchronization for another 90° in the clockwise direction of the control. At the extreme clockwise position the picture should again drop out of synchronization and 3½ to 4½ bars should be seen sloping downward to the right. If the receiver fails to hold synchronization during this check with the hold control at the extreme counter-clockwise position or fails to hold synchronization for at least 60° in the clockwise direction from the point when it drops into "sync." it will be necessary to align the horizontal oscillator circuit as follows:

(A) HORIZONTAL OSCILLATOR ALIGNMENT:

Turn horizontal hold control to extreme clockwise position. Tune in test pattern and adjust trimmer B1 until picture is out of sync. and shows 3½ to 4½ bars sloping downward to the right. If the trimmer has insufficient range, set it to its mid-position (one turn from tight) and adjust slug B2 until bars appear.

(B) HORIZONTAL LOCKING ALIGNMENT:

Turn the horizontal hold control to full counter-clockwise position. Switch to another channel and back to the original again.

Slowly turn horizontal hold control clockwise and note the least number of diagonal bars present just before picture syncs. If more than 4½ bars are present just before picture syncs. adjust "horizontal lock" trimmer B6 slightly clockwise. If less than 3½ bars are present adjust B3 slightly counter-clockwise and switch channel selector to another channel and back again. Recount bars present at the "lock-in" point. Repeat this procedure until 3½ to 4½ bars are present.

Repeat Steps (A) & (B) until conditions exist as outlined under "Horizontal Oscillator Alignment Check".

WIDTH, DRIVE & HORIZONTAL LINEARITY ADJUSTMENTS:

Turn width control B4 to maximum clockwise position. Adjust "horizontal drive" trimmer B5 for maximum brightness and linearity for right half of the picture. Readjust width control until picture fills the mask. Turn horizontal centering to align raster with the mask.

HEIGHT & VERTICAL LINEARITY ADJUSTMENTS:

Adjust the height control until picture fills mask vertically. Adjust the vertical linearity control until the test pattern is symmetrical from top to bottom.

Due to interaction between these two controls it is necessary to repeat the adjustments. Adjust the vertical centering control to align the picture with the mask.

DISASSEMBLY INSTRUCTIONS

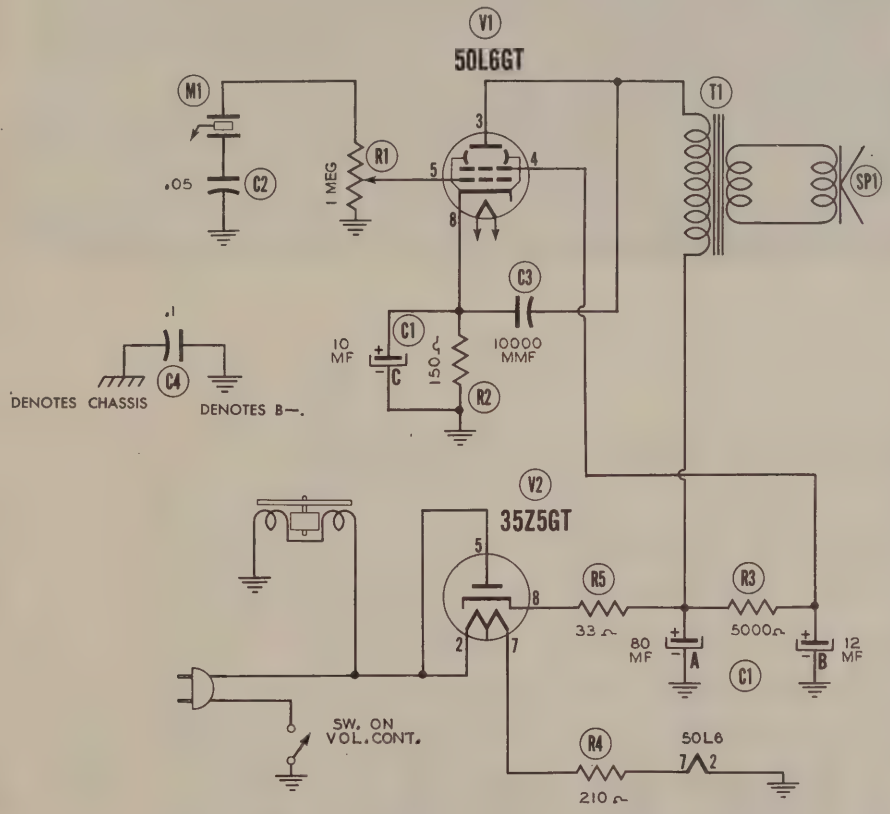
1. Remove eight push-on type control knobs.
2. Remove eight wood screws holding back cover.
3. Remove two screws holding antenna mounting strip. Remove mounting strip.
4. Remove five 7/16" hex head machine bolts holding chassis. Pull chassis out back of cabinet.

TRAV-LER MODELS
7016, 7017

TRAV-LER MODEL 7017

TRADE NAME	Trav-Ler Models 7016, 7017
MANUFACTURER	Trav-Ler Radio and Tel. Corp., 571 W. Jackson, Chicago, Illinois
TYPE SET	AC Operated Phonograph with Two Tube Amplifier and Speaker
TUBES (TWO)	Types 50L6GT AF Amp., 35Z5GT Rectifier

POWER SUPPLY 110-120 Volts AC RATING .260 Amp. at 117 Volts AC



Pin No.	50L6GT Volt.	Res.
1	0V	Inf.
2	0V	0Ω
3	120VDC	†180Ω
4	110VDC	†5KΩ
5	0V	1 Meg.
6	0V	Inf.
7	50VAC	50Ω
8	7.6VDC	150Ω

Pin No.	35Z5GT Volt.	Res.
1	0V	Inf.
2	117VAC	300Ω
3	110VAC	280Ω
4	0V	Inf.
5	117VAC	300Ω
6	0V	Inf.
7	82VAC	260Ω
8	130VDC	45KΩ

MEASURED FROM PIN8 OF V2

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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84-11

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Power Output	50L6GT	50L6GT	7AC	
V2	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRAV-LER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	150	EC-9	PRSA150/80-40	EDL8415C		TA-304 *	Filter Red
B	12	150		PRS25-10			TA-10	Filter White
C	10	25						Output Cathode Bypass Blue
C2	.05	400	PC-5	P488-05	PTE4S5		TM-15	Phono Isolation
C3	10000	500	PC-1	1467-01	PTE6S1	GP2-335-01	TM-11	Output Plate Bypass
C4	.1	400	PC-8	P488-1	PTE4P1		TM-1	Line Isolation

* Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRAV-LER PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	VC-3	Q13-137	AM-63-Z	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRAV-LER PART No.	IRC PART No.	IDENTIFICATION CODES
R2	150Ω	½	CR-11	BW-½-150	Output Cathode
R3	5000Ω	1	CR-15	BTA-4700	Filter
R4	210Ω	5	WR-1	AB-200	Filament Dropping-Wire Wound
R5	33Ω	½	CR-1		Surge Limiter

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: TRAV-LER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2KΩ	3.6Ω	176Ω	.6Ω	Part of SPK-11	A-3332 †	A-3025 †	RO-2 †	† Bend mounting tabs down and mount on original bracket.

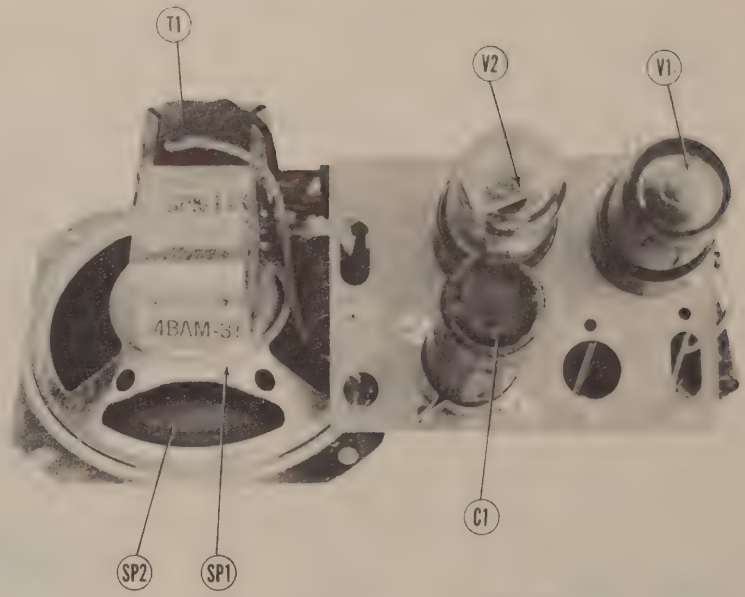
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: TRAV-LER PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113 §		
SP1	PM	3.6Ω	SPK-11	MOD. P4-X	4A07 §	§ Remount output transformer
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"				

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: TRAV-LER PART No.	ASTATIC PART No.	REMARKS
M1	PU-2	L-82-A	

CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW

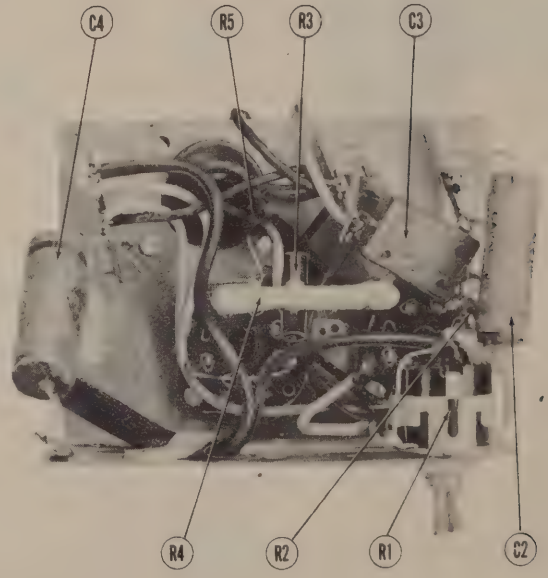


FIGURE 1

GENERAL INFORMATION

The V-M Model 800-D is a single-post changer designed to play automatically twelve 10-inch or ten 12-inch records, standard 78 R.P.M. or Microgroove 33⅓ R.P.M. records, not intermixed. Any record may be rejected, while playing, by turning the control knob to reject momentarily. The last record will be repeated until the changer is turned off. Power supply is 117-volt, 60-cycle A.C., unless otherwise specified.

Manufactured by **V-M CORPORATION**

4th and Park Streets • Benton Harbor, Michigan

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V-M
MODEL 800-D

V-M
MODEL 800-D

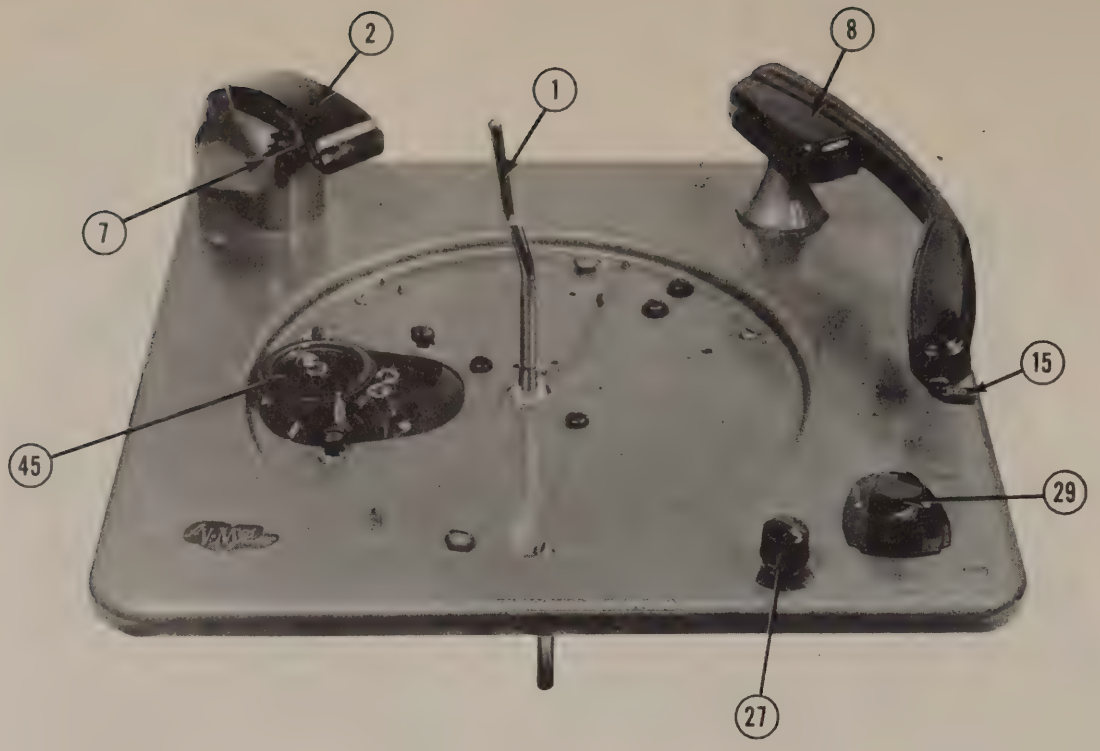

FIGURE 2

MANUAL OPERATION

Odd-size or warped records, also home recordings, should be played manually:

1. Life record clamp (2) to its vertical position.
2. Set ejector slide (7) in 12-inch position.
3. Place record on turntable.
4. For playing standard records, turn the speed control knob (27) and the cartridge pivot knob (15) to the "Std." position. For playing Microgroove records, turn the speed control knob and the cartridge pivot knob to the "slow" position.
5. Turn control knob (29) to "Man." position.
6. Place pickup arm on record.
7. Upon completion of record, return the pickup arm to its rest position.

AUTOMATIC OPERATION

1. Lift record clamp (2) to its vertical position.
2. Set ejector slide (7) in the 10 or 12-inch position, according to the size records that are going to be played.
3. Place as many as ten 12-inch or twelve 10-inch records, not intermixed, on the shelf of the spindle (1). Return the record clamp to its horizontal position.
4. Set the speed control knob (27) and the cartridge pivot knob (15) in the position corresponding with the type of records that are going to be played.
5. Turn the control knob (29) to "Rej." and release. The changer will now play the entire stack of records. After the last record has been played, the pickup arm must be returned to the arm rest, by hand, and the control knob turned to the "Off" position.

THE CHANGE CYCLE

The change cycle may be started by one of two actions:

1. Turning the control knob to "Rej." causes the control cam (76) to actuate the control link (78) and allows the trip link (60) to be pushed away from the follower (83). The follower then tilts and engages the worm (54).

2. As the pickup arm moves into the eccentric groove of the record, the movement of the pickup (8) causes the ratchet (64) to pivot the trip rod (56). As the trip rod pivots, the trip link (60) is also turned, by action of spring (58), releasing the follower (83). The follower, which transmits power for the change cycle, then engages the worm (54) and moves downward. The trip crank and lift rod assembly (74) is now pushed upward through the action of the follower arm (82). The long arm of the trip crank rides up the inclined portion of the index (70), raising the pickup and swinging it out clear of the records. As the follower (83) continues to move downward, the follower arm (82) is pivoted against the adjusting screw (55) of the ejector arm (44), actuating the trigger assembly (36), which, in turn, moves the ejector slide (7) and drops a record to the turntable.

At this point, the follower (83), guided by the follower guide (53), moves up the worm. As the follower arm (82) moves away from the adjusting screw (55) of the ejector arm (44), the ejector slide (7) returns to its rest position. Also, through the action of the follower arm (82), the trip crank and lift rod assembly (74) rides off the inclined portion and down the face of the index (70), positioning the pickup and lowering it to the record. The follower now moves off the worm and is latched by the trip link (60).

ADJUSTMENTS

Set-Down Point

To adjust the set-down point, cycle the changer and stop the turntable just before the needle comes down on the record. Loosen the lock nut (69) and adjust the index screw (68). Turning the screw clockwise will move the pickup toward the center; counter-clockwise, the pickup will move away from the record. Adjust the pickup so the needle rests ⅛" in from the edge of the record.

The set-down adjustment may be made with either 10-inch or 12-inch records and should be correct for both. If the set-down has been disturbed by holding the pickup arm during cycle, or if the pickup crank (62) is loose, the following approximate adjustment should be made before adjusting the index screw. Loosen the set screw (63) in the pickup crank and turn the crank until it is stopped by the screw in the baseplate. With the crank in this position, move the pickup arm to about ¼" from the spindle and tighten the set screw.

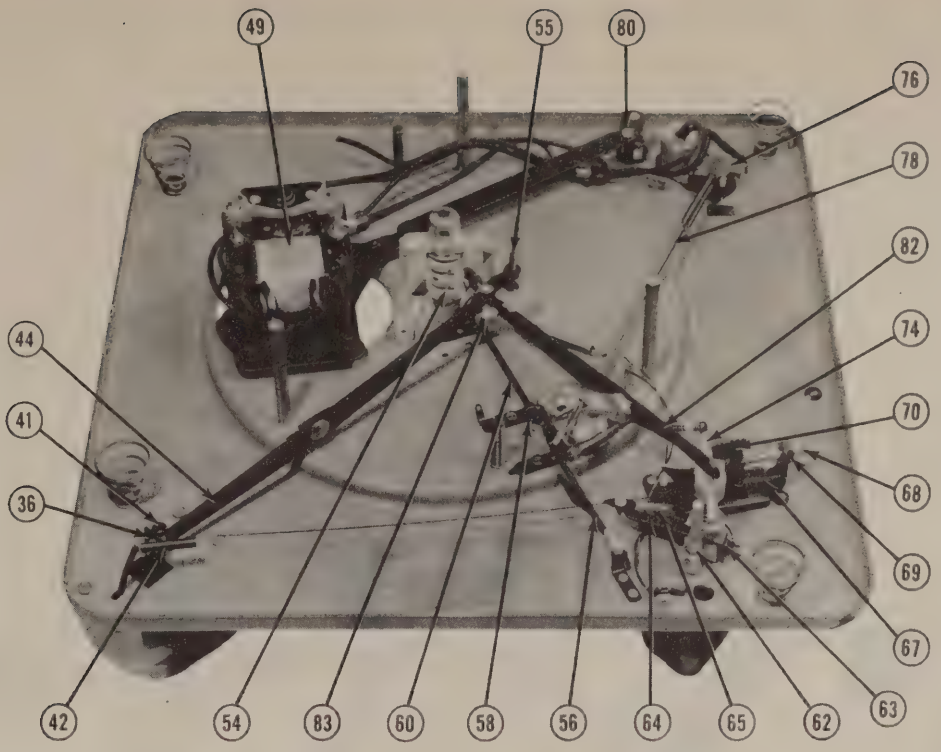

FIGURE 3

Pickup Arm Height

To adjust the height of the pickup arm, loosen the locknut on screw (18) and turn this screw until the correct adjustment is obtained. To get to this screw, raise the pickup to a vertical position; adjust so the pickup arm clears the unplayed stack of records by about ⅛" at its highest point during the change cycle.

Timing of Record Drop

The timing of the record drop is adjusted by the screw (55) on the end of the ejector arm (44). The adjustment should be such as to release the bottom record of a stack of ten 12-inch records in cycle.

Ejector Slide Adjustment

The ejector slide is adjusted by the screw (41). The adjustment should be such that the tabs are normally about 1/32" from the edge of a record.

LUBRICATION

Additional lubrication should not be required for the life of the changer, but in cases of unusual use, or high operating temperature, the changer should be lubricated as follows:

Apply Lubriplate to:

1. Worm threads (54).
2. Lift rod (74).
3. Contact point between pickup crank (62) and trip crank (74).
4. Follower arm (82).
   (a) At pivot of fulcrum (59).
   (b) At contact point of trip crank (74).
   (c) At contact point of sub-frame (52).
5. Ejector arm (44).
   (a) At contact point with trigger (36).
   (b) At contact point of follower arm (82) and screw head (55).
6. Index (70) on surfaces of slide for trip crank arm (74).

(7) Follower guide (53) where follower (83) bears.

Apply a Small Quantity of Light Oil to:

1. Between turntable shaft (22) and spindle (1).
2. Follower (83) at pivot with follower arm (82).
3. Ejector arm (44) at pivot with ejector fulcrum.
4. Index (70) at bearing with slide bracket (66).

SERVICE INFORMATION

Turntable Does Not Revolve When Control Knob Is Turned to "On" Position:

1. Machine stalled in cycle:

Turn the turntable carefully, by hand, until it starts rotating under its own power.

2. No current at motor.
3. Motor defective.

Remove the turntable to allow the motor to operate without load. If current is reaching the motor and the drive shaft does not rotate, the motor is defective.

4. Motor idler wheel not engaging turntable rim:
   (a) Check the motor idler assembly to see that it slides freely.
   (b) Wipe off the inside rim of the turntable to remove flock, or, if oily, clean the turntable rim and the rubber tire of the idler wheel with carbon tetrachloride.
5. Turntable bearing tight:

Hold idler wheel away from turntable or remove idler wheel and rotate turntable, by hand, to see that it is free. If binding occurs, remove the turntable and lubricate the oilite turntable shaft bearing with light oil.

Changer Does Not Cycle When Control Knob Is Turned to "Rej." Position:

1. Changer stalled or not driving turntable.
2. Manual reject not actuating trip.

Turn the control knob to "Rej." position, hold, and see if the hook on the end of the trip link (60) is pulled back sufficiently to allow the worm follower (83) to drop and engage in the worm threads (54).

(a) If the trip link does not release the follower, check the control link rod (78). If the rod is bent, carefully straighten it and check for trip again.

(b) If the trip link is not restricting the follower, but the follower still does not engage in the worm, the follower must be removed from the follower arm (82) and dirt, or other foreign matter, cleaned from the pivot point and from between the line of contact where the two

A PHOTOFACT "EXPLODED" VIEW

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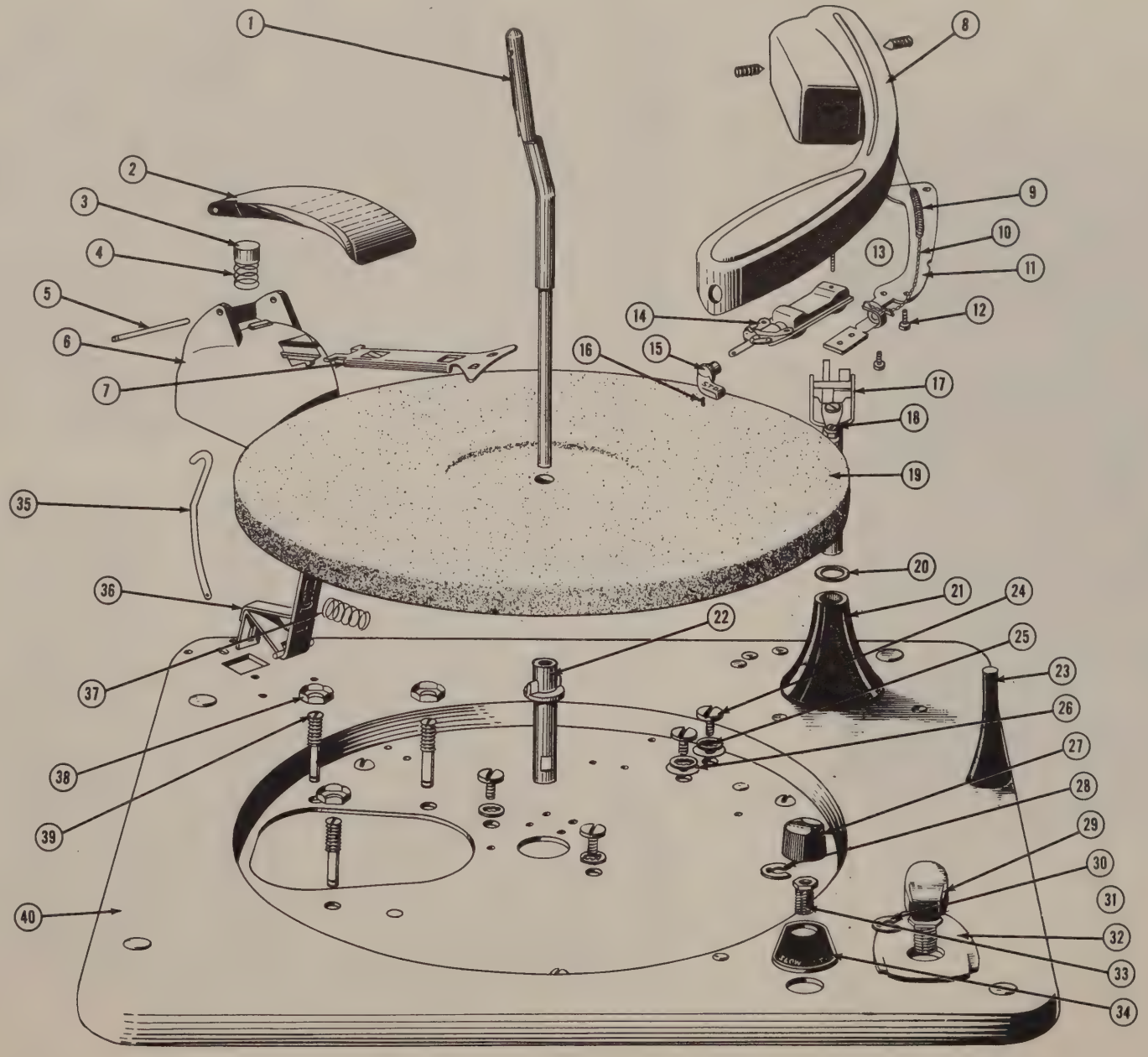

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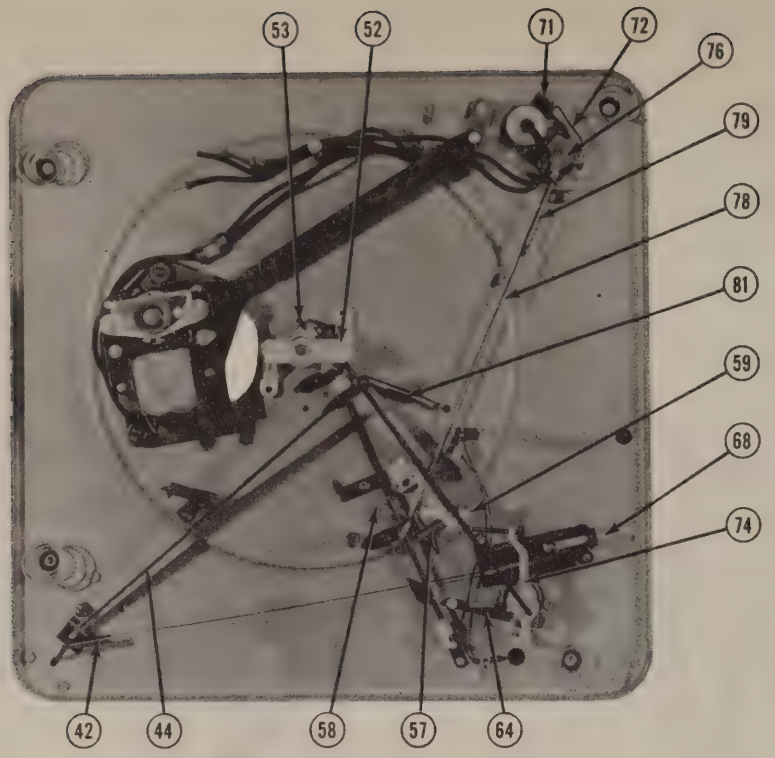

FIGURE 4

parts meet. Excessive grease may cause this binding.

To Remove the Follower:

1. Be sure the changer is not in cycle.
2. Remove the turntable.
3. Remove the two screws from base plate and sub-frame (52).
4. Carefully work the sub-frame assembly out of the base plate and revolve the assembly counter-clockwise to work off the follower and follower arm.
5. Remove the follower.

If the Follower Drops But Does Not Engage in the Worm:

1. Check for excessive wear in the pivot of the follower and follower arm.
2. Check to see if the spring (81) has become unhooked.
3. Check for dirt in the follower arm pivot.
4. Turntable not engaging turntable lock.
5. Turntable lock loose on turntable shaft.

Record Does Not Drop When Changer Cycles:

1. Check for bent spindle (1).
2. Check for under or over-size record, or enlarged center hole.
3. Check position of ejector slide (7) as given under "Adjustments."
4. Check the screw in the ejector arm (44) to see if it hits the follower arm (82) when the follower is at the bottom of the worm. If the lock nut on this screw has worked loose, reset the screw, as given under "Adjustments."
5. Check to see if the ejector slide (7) is properly seated with its pushing mechanism on the trigger (36).
6. Check for a defective trigger by slowly pulling the ejector arm (44) down by hand. If a record does not drop, the trigger (36) must be repaired or replaced.

To remove the trigger:

(a) Unhook the index spring (42) from the ejector link (35).
(b) Remove the four screws from the base plate and the housing assembly.
(c) Lift the trigger from the housing and check for broken weld on strengthening brace.

Two Records Drop at Once:

1. Hole in record too large or records too thin.
2. Slide in spindle not fully down.
   (a) Check slide to be sure it is free and does not bind at any point. Clean out foreign matter or straighten, if necessary.
   Do not oil.
   (b) When records are placed on spindle, be sure the slide is all the way down.
3. Check for position of ejector slide (7).

Record Hits Pickup Arm:

1. Check timing of changer cycle, as given under "Adjustments."
2. Check for a creeping index (70). Index "creeps" if it moves when the changer goes through cycle. To correct this condition:
   (a) Be sure that the pickup (8) and the pickup crank (62) are aligned, as given under "Adjustments."
   (b) Place the ejector slide (7) in 12" position, cycle the changer until the follower is at the bottom of the worm. The index spring (42) should be just barely slack. The ejector link (35) may be bent forward or back to give the index spring this required slack.
3. Check for too much gap between the follower arm (82) and the trip crank (74). This gap should be about the thickness of a sheet of paper (.005" to .016"). To reduce the gap, do one of the following:
   (a) Bend the follower arm up.
   (b) Replace the follower arm.

Needle Does Not Set on Either 10" or 12" Records:

1. Check the needle for 10" position by holding the index (70) in with the fingers as far as it will go and cycling the changer.
2. Check the needle set down for 12" position by holding the index out with the fingers as far as it will go and cycling the changer.
3. If these positions are correct when the index is

held in either position, check for "creeping index."

4. Check for bind between guide tabs on the index and the index screw (68).

5. Check for bind between the index and the index slide bracket (66).

Needle Does Not Track Across Record Properly:

1. Check for gap between follower arm and trip crank. This gap should be about the thickness of a sheet of paper (.005" to .016"). To increase the gap, bend the follower arm down.

2. Check for lack of vertical play of the pickup shaft in the pickup post (21). There should be .003" to .010" play here. To correct, loosen the screw (63) in the pick-up crank (62), place a shim between the pickup hinge washer and the pickup post and reset the pickup and pickup crank.

3. Check for lack of lubrication between the pickup shaft and the pickup post.

Center Trip Defective:

1. Check to be sure the control knob is in "out" position.

2. If the changer does not trip, push the trip rod (56) back, by hand, and see if the hook on the trip link (60) is pulled back sufficiently to release the worm follower. If the trip link does not release the follower, check for the following:

   (a) Bind between trip link bracket (60A) and trip link.

   (b) If the above doesn't show trouble, bend the tail of the trip link (60) in toward the side of the fulcrum. This will allow the hook on the other end of the trip link to pull back farther.

   (c) Spring (57) weak or unhooked.

3. If the changer continues to trip, check for the following:

   (a) Too much clearance between the hook on the trip link and the follower; correct by bending the tail on the trip link away from the side of the fulcrum. This will cause the hook end of the trip link to engage the follower more closely.

4. If the needle jumps out of the eccentric groove on record:

   (a) Check trip pressure. This should not exceed 12 grams. If trip pressure is too high, check:
      1. For binding.
      2. Spring (57) too strong. May be weakened by carefully stretching one of the center loops.
         (a) Record may be defective. The trip grooves are often too shallow. Check with a record known to be good.
         (b) Needle point may be worn.

Turntable Speed Too Slow:

1. Binding in turntable bearing.

2. Motor pulley too small in diameter. Replace with motor pulley of correct diameter.

3. Line voltage too low. Voltage in a 115-volt changer should not be less than 100 volts.

4. Operating temperature too low. Surrounding temperature should not be less than 60°F.

Turntable Speed Too Fast:

1. Motor pulley too large in diameter. Replace with motor pulley of correct diameter.

Turntable Stalls in Cycle:

1. Motor idler (45) not engaging turntable with sufficient tension.

2. Turntable bearing tight.

3. Operating temperature too low.

4. Line voltage too low.

5. Binding between follower and worm:

   (a) Check lubrication of follower arm at point of bearing with sub-frame.

   (b) Check lubrication of worm threads.

   (c) File some metal from the follower arm at the point of bearing with the sub-frame to allow more clearance between the worm and the follower.

1. Remove the follower as described in the second paragraph.

2. Remove spring (81).

3. Remove cotter pin (77).

4. Remove follower arm.

Trip Crank (74) Jams on Index (70):

   (a) Check for lubrication on index at point of bearing with trip crank.

   (b) Check for burrs on the inclined surface of the index. Surface must be very smooth. Polish with crocus cloth.

   (c) Check for grooves worn into trip crank arm at contact point with index. File smooth with fine file, if necessary.

Noise During Playing of Record:

1. Rumble:

   (a) From motor: If a low-pitched rumbling sound comes from the loud speaker while a record is being played, check the motor grommets to be sure the motor is setting freely on them. The motor lead wires should have enough slack to allow the motor to float. Motor rumble may also come from an out-of-balance motor rotor. In this case, the motor should be replaced.

   (b) From bearings: Defective turntable shaft bearings can cause rumble. Check for foreign matter. Lubricate with lubriplate or light oil.

2. Defective Motor Idler Wheel:

A rapid thumping sound while the motor is running may indicate a flat spot on the motor idler wheel. Remove the turntable and check the rubber tire on the idler. If the surface of the rubber tire is not smooth and even, replace the idler.

3. Defective Needle:

A bad needle will cause loud needle scratch or hiss through both the speaker and the air directly from the needle.

4. Turntable Scrapes:

If a scraping sound occurs as the turntable revolves, check:

   (a) Turntable warped, causing outer rim to rise and fall.

   (b) Motor idler bent.

5. Squeaks:

Squeaking sound as changer operates, indicates lack of lubrication. Lubricate points indicated under "Lubrication."

Excessive Record Wear:

1. Binding in pickup arm.

2. Defective needle.

3. Excessive needle pressure.

Turntable Will Not Rotate at 33⅓ R.P.M.:

1. Speed control lever (85) not being actuated by the control arm (80).

2. Pulley (45) not engaging the small diameter of the motor shaft.

   (a) Place extra washers (46) under the pulley to raise it high enough to engage the small diameter.

3. Spring (48) loose, therefore not pulling the pulley (45) in contact with the motor shaft.

4. Grommet (84) missing, which results in speed control lever (85) not being moved far enough for the pulley (45) to raise to engage the small diameter of the shaft.

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	2414	Spindle assembly—consists of:
		1535 Pin
		1676 Spindle guide
		1687 Spring
		2413 Spindle shaft
2	1746	Plastic hold down
3		Hold-down cup
4	428	Push spring
5	941-A	Hinge pin
6	760	Housing assembly—consists of:
		428 Push spring (item 4)
		695 Ejector link (item 35)
		941-A Hinge pin (item 5)
		1746 Plastic hold down (item 2)
		1793 Housing (item 6)
		1802 Ejector slide (item 7)
		777 Trigger assembly (item 36)
7	1802	Ejector slide
8	2375	Tone arm assembly—consists of:
		2197 Cartridge (Webster F-14 with needle)
		2630 Dual needle for Webster cartridge
		2606 Cartridge (Shure) with needles
		2628 One mil needle for Shure cartridge
		2629 Three mil needle for Shure cartridge
		2336 Cartridge control knob (item 15)
		2372 Tone arm only (item 8)
		2377 Strengthener assembly (item 11)
		2378 Cable clamp assembly
		2492 Spring and chain assembly (items 9 & 10)
9 & 10	2492	Spring and chain asembly
11	2377	Strengthener and pivot assembly—consists of:
		2307 Eyelet
		2312 Spring
		2313 Strengthener
		2318 Pivot bracket
12		Strengthener mounting screw
13		Cartridge mounting screw
14		Cartridge (see item 8 for cartridge & needle)
15	2336	Cartridge control knob
16		Control knob set screw
17	2376	Pickup hinge assembly—consists of:
		48 Fiber washer
		698 Shaft
		940 Hinge
		2309 Hinge pin
		2314 Bracket
18		Height adjustment screw & nut
19	608-A	Turntable
20	48	Fiber washer
21	681-B	Pickup post
22	1805	Turntable shaft assembly—consists of:
		679 Lock
		1804 Shaft
23		Pickup rest post
24		Fulcrum mounting screw
25		Lockwasher
26		Flat washer
27	2198	Speed control knob
28		"C" washer
29	1711-B	Knob
30	1719	"C" washer
31	1789	Control shaft bearing
32	963-3G	Escutcheon
33		Control shaft bearing
34	2343	Escutcheon for speed control
35	695	Ejector link
36	777	Trigger assembly
37		Trigger assembly return spring
38		Hex nut—motor mounting
39	2358	Motor mounting screw
40	2380	Base plate assembly—consists of:
		89 Power cord clamp
		123 Pickup cord clamp
		474 Mounting spring
		681 Pickup post
		2077 Shipping bolt
		1895 Terminal strip
		2361 Base plate
		1806 Index slide assembly (item 66)
41	1668	Record shelf adjusting screw No. 6-32 x ½ B.H.
42	884	Index spring
43		"C" washer
44	1821	Ejector and fulcrum assembly—consists of:
		669 Ejector arm
		705 Rivet
		1766 Ejector arm fulcrum
45	2635	Idler wheel
46		Felt washer
47		Motor mounting grommet
48		Idler wheel tension spring
49	2352	Motor (Russell 117-volt, 60-cycle)—includes:
		2635 Idler wheel
		Shifting cam
		Control lever
50	2359	Motor mounting washer
51		"C" washer
52	2411	Sub-frame assembly—consists of:
		680 Worm (item 54)
		707 Set screw
		724 Ball-bearing
		875 Follower guide (item 53)
		1805 Turntable shaft assembly (item 22)
		2409 Sub-frame bushing
		2415 Sub-frame (item 52)
53	875	Follower guide
54	680	Worm
55	1807	Screw No. 6-32 Phillips T. Hd.
56	2335	Ratchet assembly—consists of:
		2199 Trip rod (item 56)
		2330 Ratchet (item 56A)
57	1909	Control spring
58	2327	Trip spring
59	926	Fulcrum
60	2200	Trip link
60A		Trip link bearing
61	1660	Control bearing nut
62	2495	Crank and ratchet pawl assembly—consists of:
		1547 Pin
		1606 Pawl
		711 Screw
		2621 Pickup crank
		2329 Pawl spring
63		Screw No. 10-32 x ⅝"
64		Ratchet pawl arm assembly
65	2329	Pawl spring
66	1806	Index slide assembly—consists of:
		712 Nut (item 69)
		1663 Spring (item 67)
		1785 Index (item 70)
		1786 Slide bracket (item 66)
		2177 Index screw (item 68)
67	1663	Index spring
68	2177	Index screw
69	712	Nut
70	1785	Index
71	1748	Switch bracket assembly—consists of:
		94 Rivet
		467 Switch
		1769 Switch bracket
		1788 Cam spring (item 72)
72	1788	Cam spring
73	1660	Control bearing nut
74	1755	Trip crank assembly—consists of:
		833 Lift shaft
		1769 Trip crank
75	686	Crank spring
76	1800	Control cam assembly
		1770 Control cam shaft
		1774 Control cam
77	996	Cotter pin
78	2337	Control link
79		Control link spring
80	2384	Speed linkage assembly—consists of:
		2258 Rivet
		2353 Link
		2357 Grommet (item 84)
		2382 Shaft arm assembly
81		Spring
82	1791	Follower arm assembly—consists of:
		1792 Follower arm bushing
		1797 Follower arm
83	1795	Follower
84	2357	Grommet
85		Control lever

PHOTOFACT* Folder

WESTINGHOUSE MODELS H-196A (DX), H-207A (DX), H-207B (DX), H-225 (DX)

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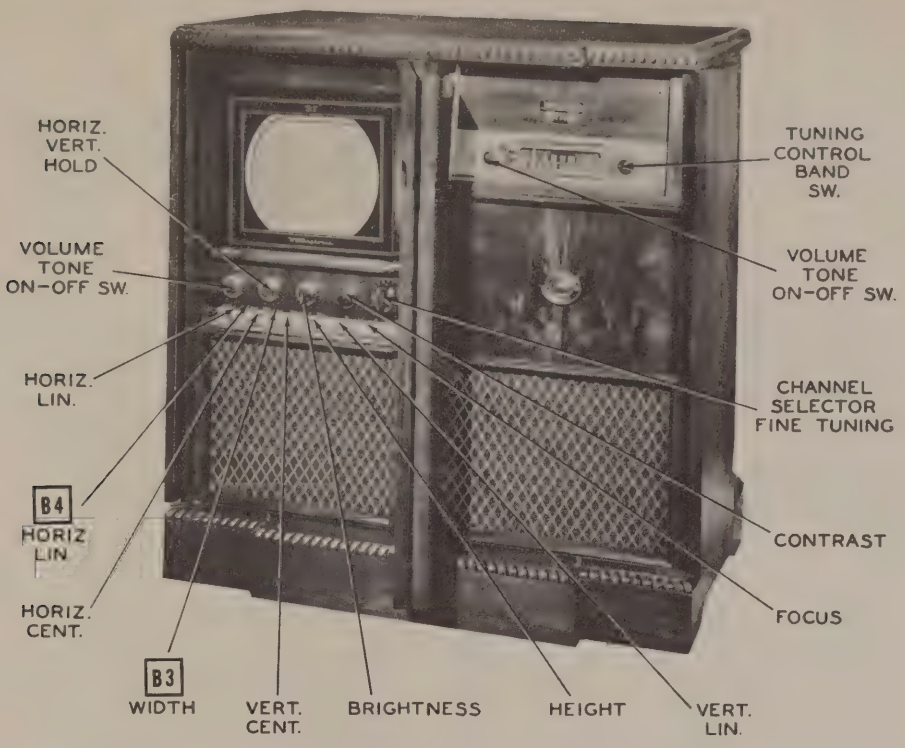

TRADE NAME	Westinghouse Models H-196A (DX) (Ch. V-2130-11DX or V-2130-12DX), H-207A (DX) (Ch. V-2130-11DX or V-2130-12DX and Radio Ch. V-2137), H-207B (DX) (Ch. V-2130-21DX or V-2130-22DX and Radio Ch. V-2137), H-225 (DX) (Ch. V-2130-31DX or V-2130-32DX)
MANUFACTURER	Westinghouse Electric Corp., Receiver Div., Sunbury, Pa.
TYPE SET	AM-FM-Phono-TV Combination Receiver (Models H-196A (DX) and H-225 (DX) TV Only).
TUBES	Thirty-Six (Combination Models) Twenty-Nine (TV Only Models).
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATINGS	2.25Amp. at 117 Volts AC (TV) .76 Amp. at 117 Volts AC (Radio)
TUNING RANGES	AM...540-1600KC, FM...88-108MC, TV...Channels 2 thru 13

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WESTINGHOUSE MODELS H-196A (DX), H-207A (DX), H-207B (DX), H-225 (DX)

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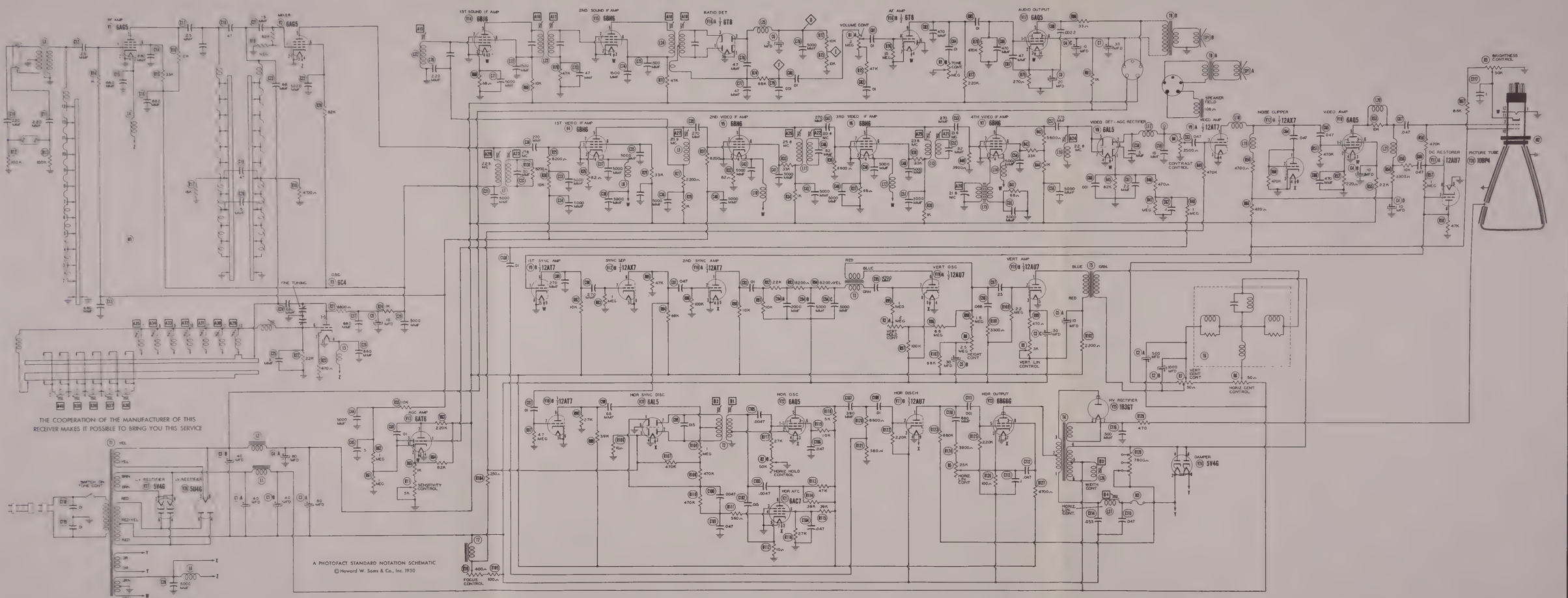
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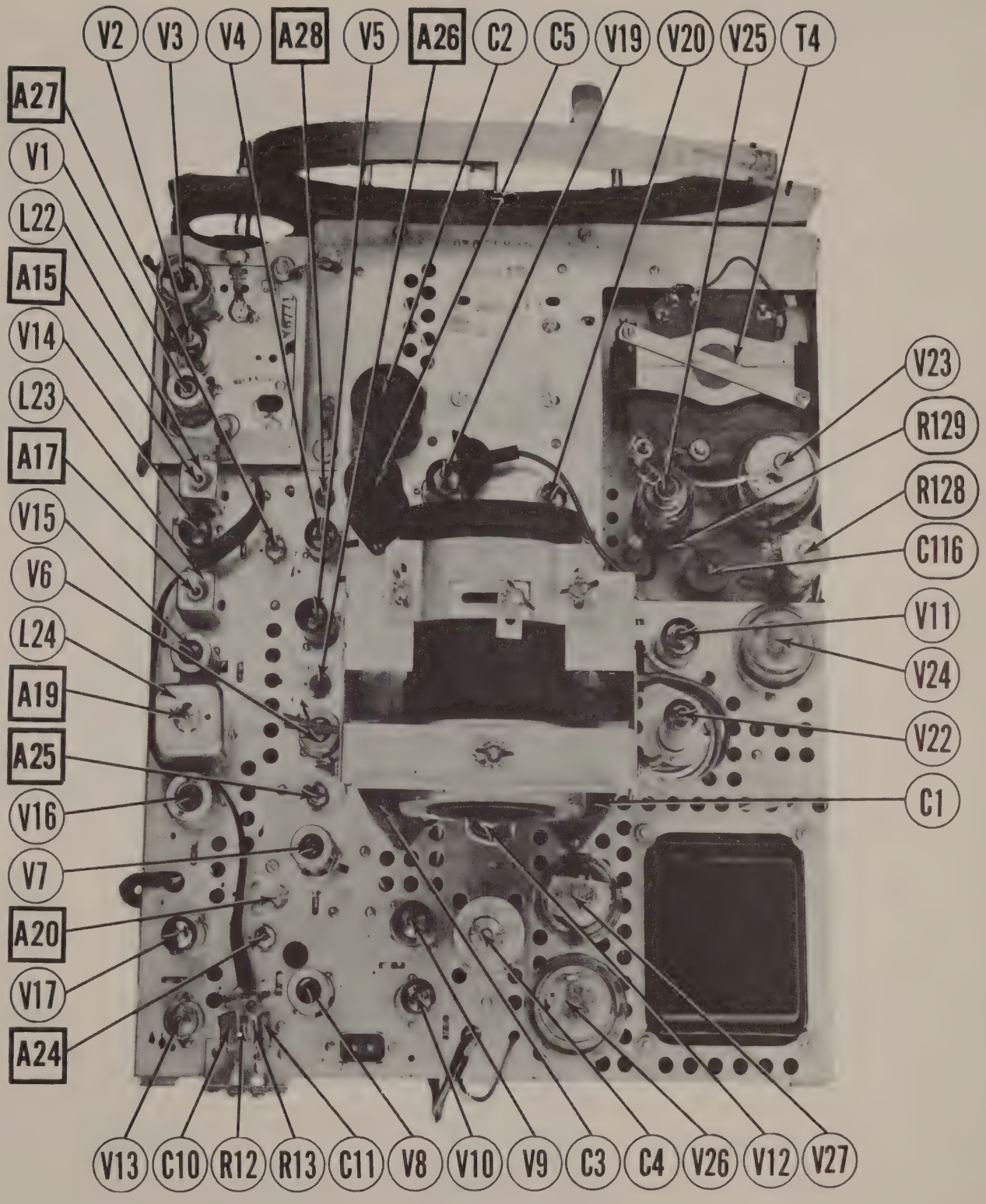
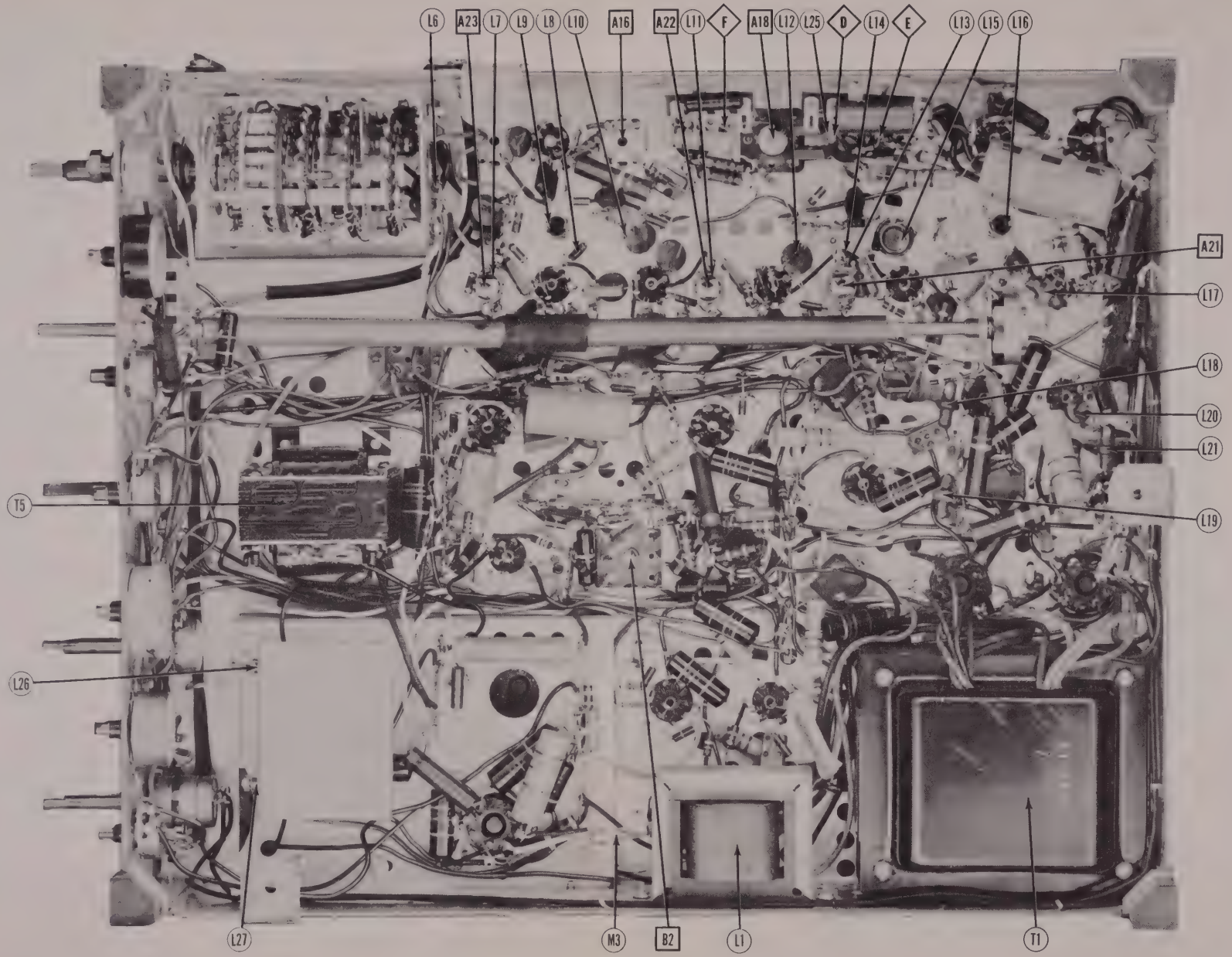
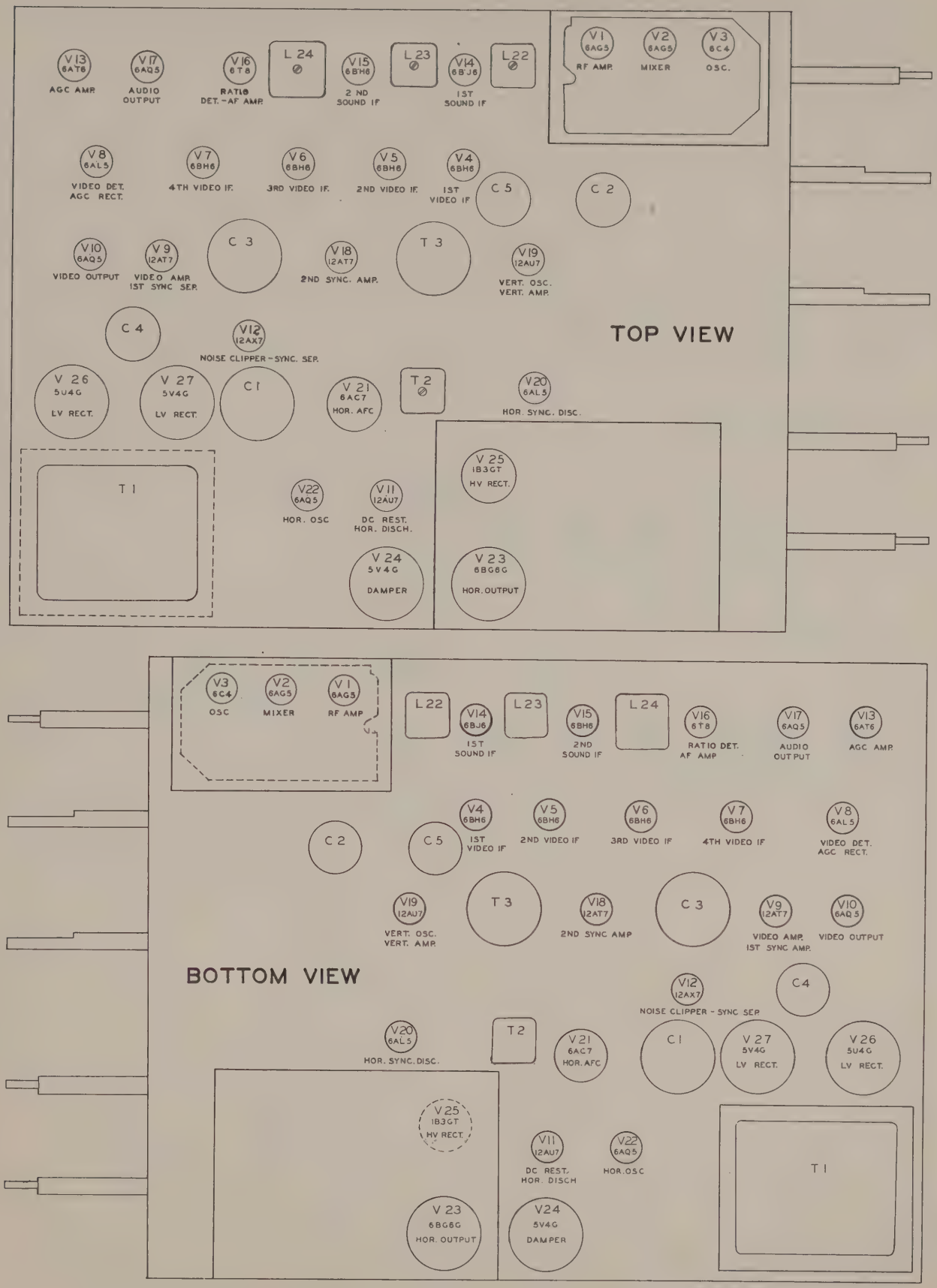


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION


V13 6AT6 AGC AMP
V17 6AQ5 AUDIO OUTPUT
V16 6T8 RATIO DET. - AF AMP
L 24
V15 6BH6 2 ND SOUND IF
L 23
V14 6BJ6 1ST SOUND IF
L22
V1 6AG5 RF AMP.
V2 6AG5 MIXER
V3 6C4 OSC.
V8 6AL5 VIDEO DET. AGC RECT.
V7 6BH6 4TH VIDEO IF.
V6 6BH6 3RD VIDEO IF.
V5 6BH6 2ND VIDEO IF.
V4 6BH6 1ST VIDEO IF
C 5
C 2
C 3
T 3
V10 6AQ5 VIDEO OUTPUT
V9 12AT7 VIDEO AMP. 1ST SYNC SEP.
V18 12AT7 2ND SYNC. AMP.
V19 12AU7 VERT. OSC. VERT. AMP.
TOP VIEW
C 4
V12 12AX7 NOISE CLIPPER - SYNC. SEP.
V 26 5U4G LV RECT.
V 27 5V4G LV RECT.
C1
V 21 6AC7 HOR. AFC
T 2
V20 6AL5 HOR. SYNC. DISC.
V 25 1B3GT HV RECT.
T 1
V22 6AQ5 HOR. OSC
V11 12AU7 DC REST. HOR. DISCH.
V 24 5V4G DAMPER
V 23 6BG6G HOR. OUTPUT
BOTTOM VIEW

TUBE PLACEMENT CHART

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer, turn tuning capacitor fully closed and set pointer at last reference mark at left hand edge of dial.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 1-6BA6 (V31). Low side to chassis.	455KC	AM (center pos.)	Tuning cap fully open	Across voice coil	A1, A2	Adjust for maximum output.
2	.1MFD	High side to pin 1 6BE6 (V30). Low side to chassis.	"	"	"	"	A3, A4	"
3		Loop	1600KC	"	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4		Loop	1400KC	"	Tune for max. output.	"	A6	Rock tuning cap and adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Before starting step 7, connect two 100KΩ matched resistors (± 5%) connected in series from pin 7 6AL5 (V33) to chassis. (See Schematic). Connect the DC Probe of the VTVM to point B and the common lead to point C.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5	1000MMF	High side to pin 1 6BA6 (V31). Low side to chassis.	10.7MC	FM (ext. CCW)	Tuning cap fully open	DC Probe to Point (A) Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
6	1000MMF	High side to pin 7 12AT7 (V29). Low side to chassis.	"	"	"	"	A10, A11	Adjust for maximum deflection.
7	1000MMF	"	"	"	"	DC Probe to Point (B) Common lead to Point (C)	A12	Adjust for zero reading. A positive or negative reading on either side denotes the correct setting. Remove the two 100KΩ resistors.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5	1000MMF	High side to pin 1 6BA6 (V31). Low side to chassis.	10.7MC (450KC Sweep)	FM	Tuning cap fully open	Vertical Amp. to Point (A) Low side to chassis.	A7, A8, A9	Disconnect stabilizer capacitor (C121). Adjust for maximum amplitude and symmetry as per Fig 1.
6	1000MMF	High side to pin 7 12AT7 (V29). Low side to chassis.	"	"	"	"	A10, A11	Adjust for maximum amplitude and symmetry as per Fig 1.
7	1000MMF	"	"	"	"	Vertical Amp. to Point (B) Low side to chassis.	A12	Reconnect stabilizer cap. Adjust so cross-over point occurrs at center of pattern as per Fig 2. If necessary, slightly retouch A7 for maximum amplitude and straightness of cross over lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8	300Ω carbon res.	High side to terminal 1 of antenna strip. Low side to terminal 2.	105MC	FM	105MC	DC Probe to Point (A) Low side to chassis.	A13	Adjust for maximum deflection.
9	300Ω carbon res.	"	"	"	Tune for max. output.	"	A14	Adjust for maximum deflection.

FIG. 1

FIG. 2

TV ALIGNMENT INSTRUCTIONS

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Attenuate the signal generator to give approximately a 5 volt reading on the VTVM using the 10 volt scale.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10	500MMF	High side to pin 1 (Grid) of 6AG5 (V2). Low side to chassis.	21.6MC	3	DC Probe to Point (D) Common to chassis.	A15, A16, A17, A18	Adjust for maximum deflection.
11	500MMF	"	"	"	DC Probe to Point (F) Common to Point (E)	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10	500MMF	High side to pin 1 (Grid) of 6AG5 (V2). Low side to chassis.	21.6MC (1MC Sweep)	21.45MC 21.6MC 21.8MC	3	Vert. Amp. to Point (D) Low side to chassis.	A15, A16, A17, A18	Disconnect stabilizer cap (C6). Adjust for maximum amplitude and symmetry as per Fig 3.
11	500MMF	"	"	21.35MC 21.6MC 21.85MC	3	Vert. Amp. to Point (C) Low side to chassis.	A19	Reconnect stabilizer cap. Adjust A19 so 21.6MC marker appears at center of pattern as per Fig 4.

VIDEO IF ALIGNMENT

Connect the bias unit shown in Fig 5 to the AGC line.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12	500MMF	High side to pin 1 (Grid) of 6AG5 (V2). Low side to chassis.	21.6MC	3	DC Probe to Video Test Jack on chassis. Common to chassis.	A20	Adjust for minimum deflection.
13	500MMF	"	21.6MC	"	"	A21	Adjust for minimum deflection.
14	500MMF	"	20.4MC	"	"	A22	Adjust for minimum deflection.
15	500MMF	"	27.6MC	"	"	A23	Adjust for minimum deflection.
16	500MMF	"	22.8MC	"	"	A24	Adjust for maximum deflection.
17	500MMF	"	23.8MC	"	"	A25	Adjust for maximum deflection. If A25 required adjustment, repeat step 13.
18	500MMF	"	25.6MC	"	"	A25	Adjust for maximum deflection. If A26 required adjustment, repeat step 14.
19	500MMF	"	25.9MC	"	"	A27	Adjust for maximum deflection.
20	500MMF	"	22.3MC	"	"	A28	Adjust for maximum deflection. If A28 required adjustment, repeat step 15.

OVERALL VIDEO IF RESPONSE CHECK

Leave the bias unit connected for this visual check.
Shunt the vertical amplifier connections of the oscilloscope with a 500MMF capacitor and insert a 200KΩ resistor in series with the high side lead.
Connect the horizontal amplifier to the synchronized sweep voltage output of the signal generator.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
21	500MMF	High side to pin 1 (Grid) of 6AG5 (V2). Low side to chassis.	25MC (12MC Sweep)	21.6MC 22.5MC 23.0MC 25.3MC 26.1MC 27.0MC	3	Vert. Amp. thru 200KΩ to video test jack. Low side to chassis. (See instructions above)	A20 thru A28	Check to see that markers appear on pattern obtained as per Fig 6. SLIGHT adjustment of A24 and A25 will usually properly place the markers. If readjustment of A25, A26 and A28 is made their respective traps must be rechecked. Do not adjust any trap except A22 to correct the response curve.

TV OSCILLATOR ALIGNMENT

The RF amplifier and mixer circuits of the tuner are very stable and normally do not require adjustment in the field.
When adjusting the oscillator circuits, turn the fine tuning control to the mid point of its tuning range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
22	Two 150Ω carbon res.	Across antenna terminals with 150Ω in each lead.	215.75MC (Unmod.)	13	DC Probe to Point (F) Common to Point (E)	A29	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			209.75MC	12		A30	
			203.75MC	11		A31	
			197.75MC	10		A32	
			191.75MC	9		A33	
			185.75MC	8		A34	
			179.75MC	7		A35	
			87.75MC	6		A36	
			81.75MC	5		A37	
			71.75MC	4		A38	
			65.75MC	3		A39	
			59.75MC	2		A40	

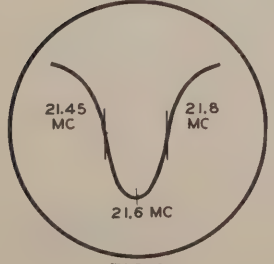


FIG.3

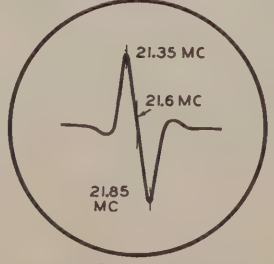


FIG. 4

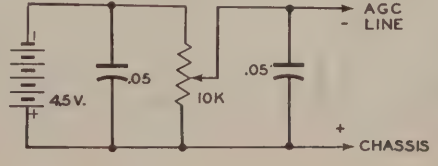


FIG. 5

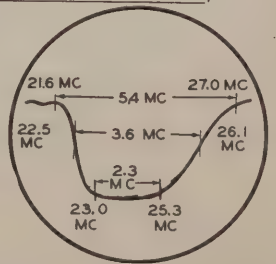
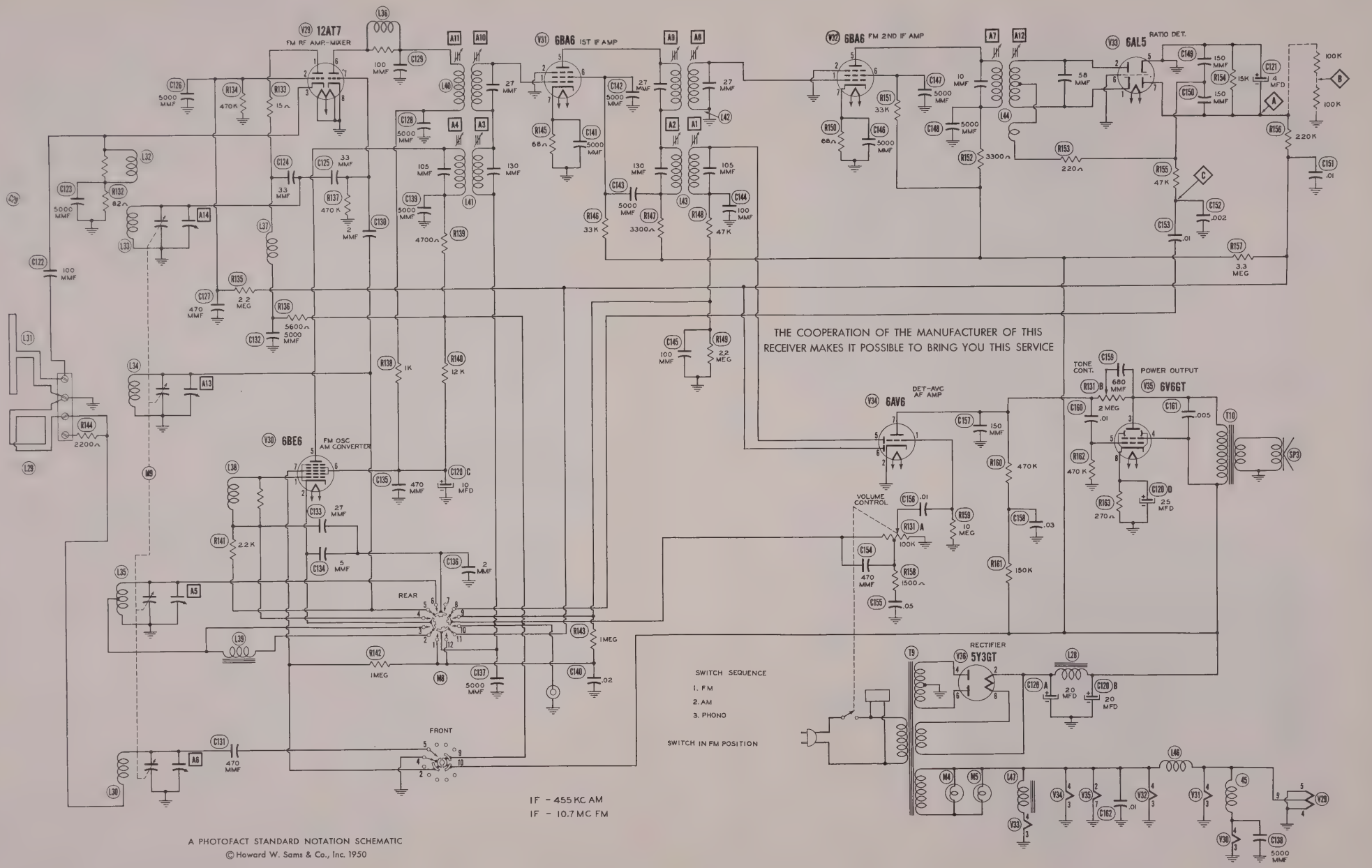
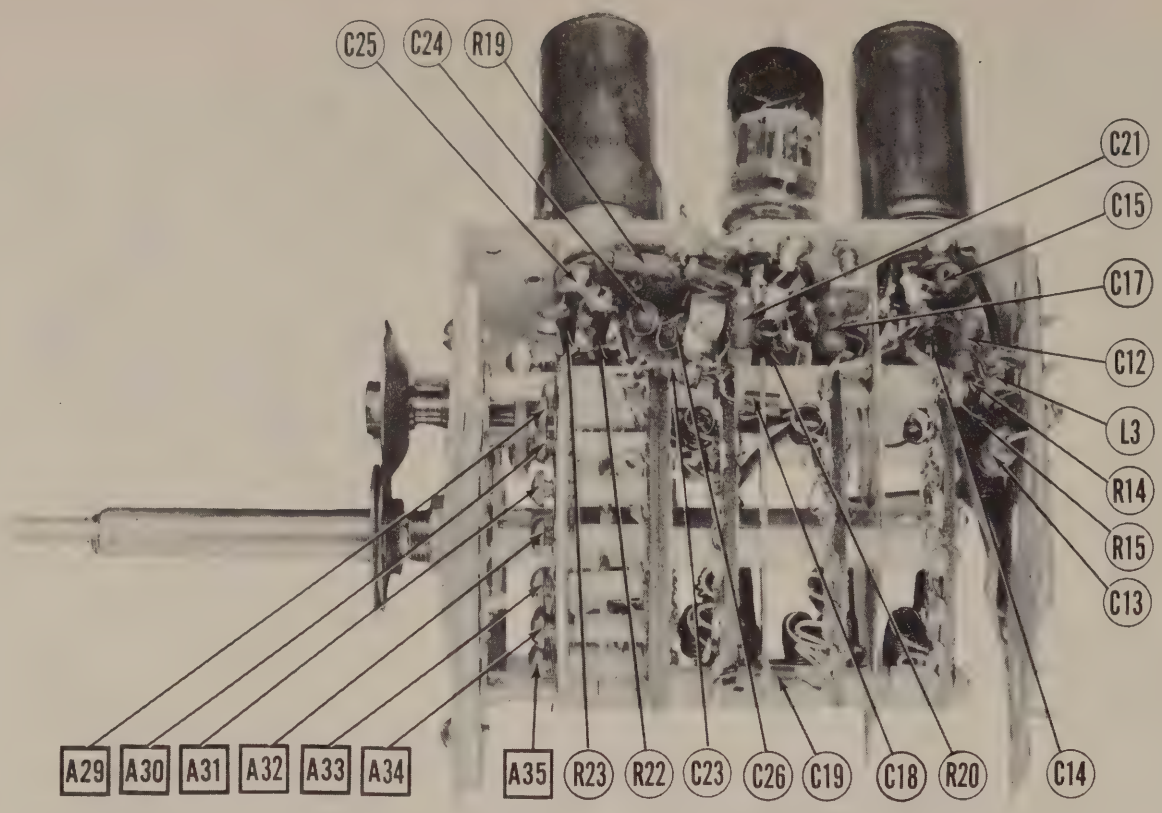


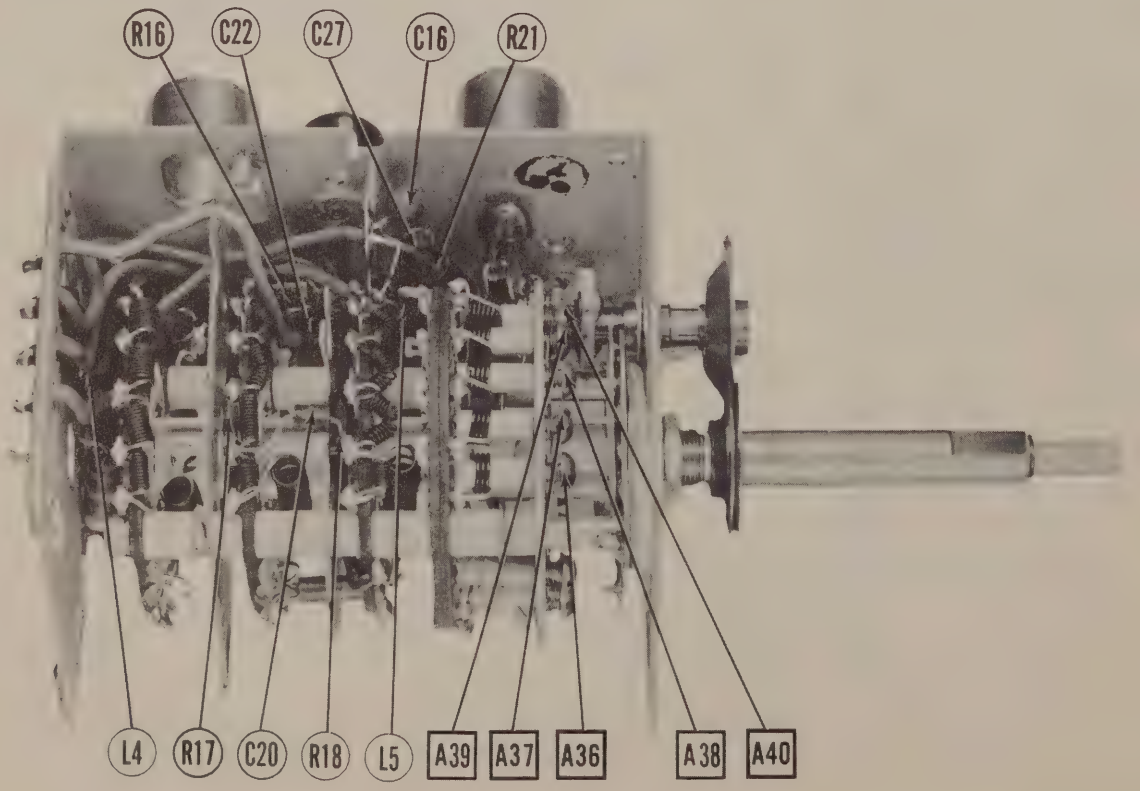
FIG. 6


V29 12AT7
FM RF AMP.-MIXER
V31 6BA6 1ST IF AMP
V32 6BA6 FM 2ND IF AMP
V33 6AL5 RATIO DET.
V30 6BE6 FM OSC AM CONVERTER
V34 6AV6 DET.-AVC AF AMP
V35 6V6GT POWER OUTPUT
V36 5Y3GT RECTIFIER
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
TONE CONT.
VOLUME CONTROL
REAR
FRONT
SWITCH SEQUENCE
1. FM
2. AM
3. PHONO
SWITCH IN FM POSITION
IF - 455 KC AM
IF - 10.7 MC FM
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1950

RADIO CHASSIS V-2137



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

RADIO CHASSIS-TOP VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.5VDC	0V	6.3VAC	0V	130VDC	117VDC	0V		
V 2	6AG5	-1.6VDC	0V	0V	6.3VAC	250VDC	135VDC	0V		
V 3	6C4	180VDC	0V	0V	6.3VAC	180VDC	§-2.9VDC	4.9VDC		
V 4	6BH6	-3.9VDC	.7VDC	6VAC	0V	220VDC	180VDC	0V		
V 5	6BH6	-.5VDC	.6VDC	6VAC	0V	240VDC	165VDC	0V		
V 6	6BH6	0V	.7VDC	6VAC	0V	230VDC	145VDC	0V		
V 7	6BH6	0V	.6VDC	6VAC	0V	200VDC	155VDC	0V		
V 8	6AL5	.5VDC	-.9VDC	6.3VAC	0V	0V	0V	0V		
V 9	12AT7	215VDC	-.7VDC	0V	0V	0V	140VDC	-.5VDC	0V	6.3VAC
V 10	6AQ5	0V	7.2VDC	6.3VAC	0V	155VDC	170VDC	0V		
V 11	12AU7	♦92VDC	♦-37VDC	♦0V	0V	0V	-.5VDC	-.5VDC	.1VDC	6.3VAC
V 12	12AX7	-.5VDC	-.5VDC	0V	0V	0V	100VDC	-3.9VDC	0V	6.3VAC
V 13	6AT6	.1VDC	6.2VDC	6.3VAC	0V	-.1VDC	-.1VDC	225VDC		
V 14	6BJ6	0V	1VDC	6.3VAC	0V	95VDC	95VDC	0V		
V 15	6BH6	-.4VDC	0V	6.3VAC	0V	60VDC	60VDC	0V		
V 16	6T8	-.4VDC	-.6VDC	-.3VDC	6.3VAC	0V	0V	0V	-.5VDC	75VDC
V 17	6AQ5	0V	9.3VDC	6.3VAC	0V	225VDC	240VDC	0V		
V 18	12AT7	150VDC	-1.5VDC	0V	0V	0V	65VDC	-1.6VDC	0V	6.3VAC
V 19	12AU7	♦285VDC	♦-.7VDC	♦5.4VDC ♦14VDC	0V	0V	♦30VDC ♦65VDC	♦-5.4VDC	♦0V	6.3VAC
V 20	6AL5	-.3VDC	-7VDC	6.3VAC	0V	-2.1VDC	0V	-6.8VDC		
V 21	6AC7	0V	6.3VAC	0V	-.7VDC	.1VDC	75VDC	0V	120VDC	
V 22	6AQ5	-25VDC	.2VDC	6.3VAC	0V	175VDC	150VDC	-25VDC		
V 23	6BG6G	0V	0V	♦9.5VDC	0V	♦-4.5VDC	♦420VDC	6.3VAC	♦235VDC	TOP CAP *
V 24	5V4G	0V	340VDC	0V	270VDC	0V	270VDC	0V	340VDC	
V 25	1B3GT	* DO NOT MEASURE								
V 26	5U4G	0V	255VDC	0V	330VAC	150VDC	330VAC	265VDC	255VDC	
V 27	5V4G	0V	300VDC	255VDC	330VAC	0V	330VAC	0V	300VDC	
V 28	10BP4	0V	.1VDC	PIN 10 265VDC	PIN 11 125VDC	PIN 12 6.3VAC				
† V 29	12AT7	195VDC	.1VDC	1VDC	0V	0V	123VDC	-2.2VDC	0V	6.3VAC
V30A	6BE6	§-8.8VDC	0V	0V	6.3VAC	250VDC	108VDC	-.1VDC		
† V30B	6BE6	§-6.6VDC	0V	0V	6.3VAC	250VDC	125VDC	0V		
V31	6BA6	-.1VDC	0V	0V	6.3VAC	235VDC	107VDC	1.1VDC		
† V32	6BA6	0V	0V	0V	6.3VAC	235VDC	110VDC	1.2VDC		
† V33	6AL5	-.8VDC	0V	0V	6.3VAC	0V	0V	-.4VDC		
V34	6AV6	-.4VDC	0V	0V	6.3VAC	-.3VDC	.7VDC	90VDC		
V35	6V6GT	0V	6.3VAC	250VDC	265VDC	0V	220VDC	0V	13.5VDC	
V36	5Y3GT	0V	295VDC	0V	300VAC	0V	300VAC	0V	295VDC	

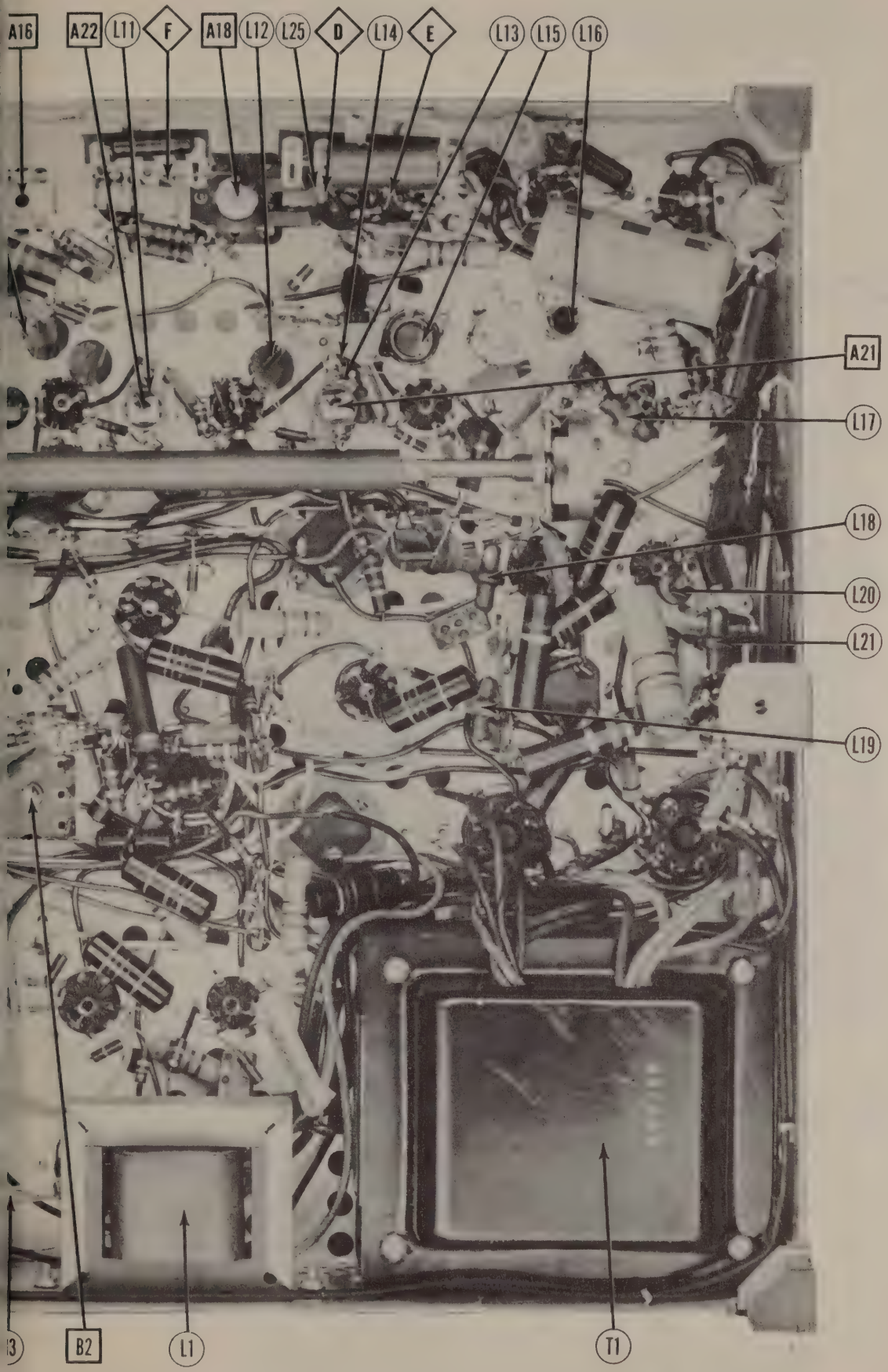
§ TAKEN WITH VACUUM TUBE VOLTMETER.
† TAKEN IN FM POSITION.
* DO NOT MEASURE.
♦ MEASURED FROM PIN 8 OF V19.

RESISTANCE READINGS

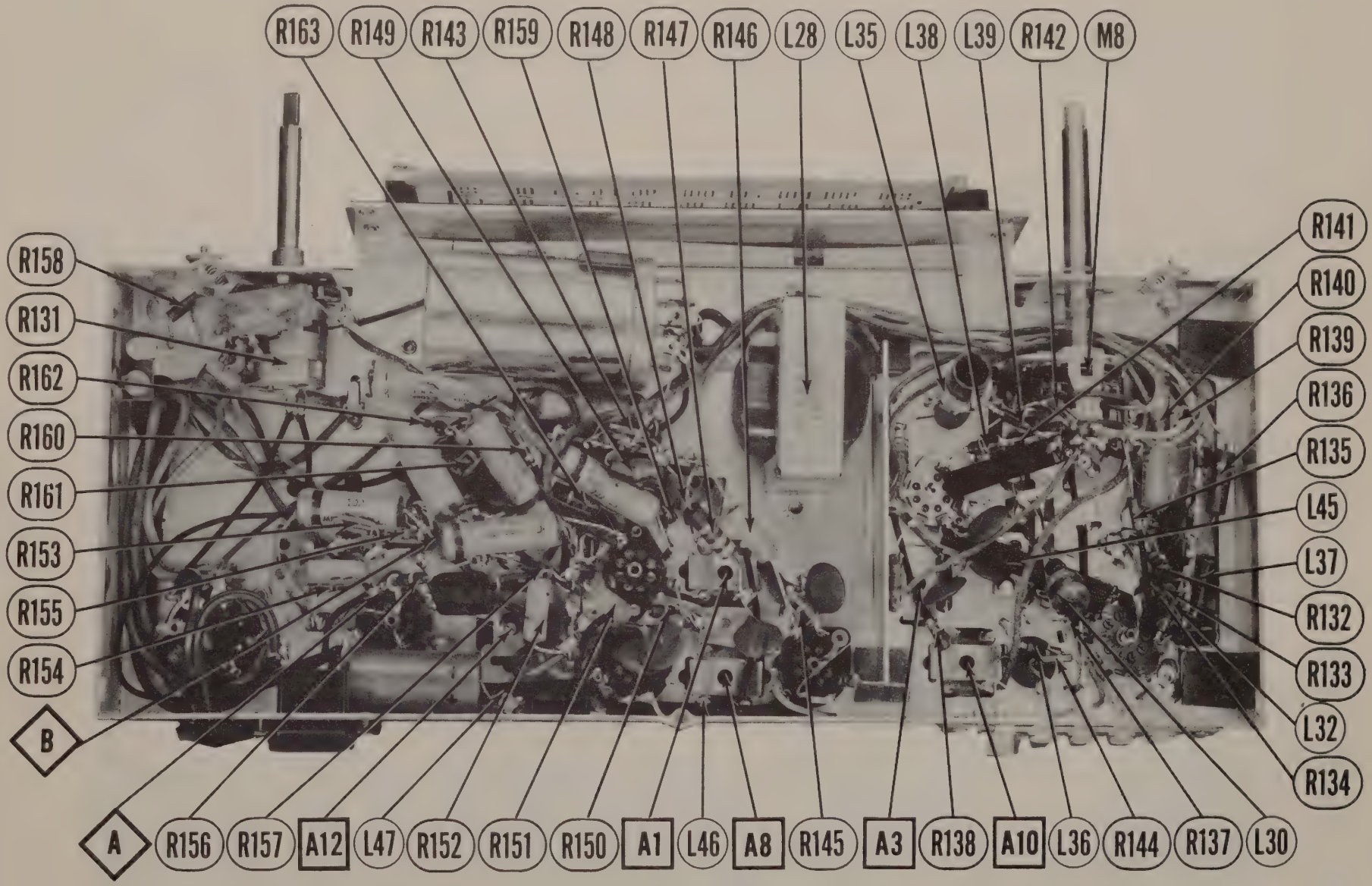
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	2 Meg.	0Ω	.1Ω	0Ω	†10KΩ	†33KΩ	0Ω		
V 2	6AG5	1 Meg.	0Ω	0Ω	.1Ω	†100Ω	†82KΩ	0Ω		
V 3	6C4	†8KΩ	Inf.	0Ω	.1Ω	†8KΩ	22KΩ	470Ω		
V 4	6BH6	2 Meg.	82Ω	1Ω	0Ω	†3.5KΩ	†33KΩ	0Ω		
V 5	6BH6	2 Meg.	82Ω	1Ω	0Ω	†1KΩ	†34KΩ	0Ω		
V 6	6BH6	6.8KΩ	68Ω	1Ω	0Ω	†1KΩ	†34KΩ	0Ω		
V 7	6BH6	3.9KΩ	68Ω	1Ω	0Ω	†6.5KΩ	†34KΩ	0Ω		
V 8	6AL5	80KΩ	2.5KΩ	.1Ω	0Ω	.1Ω	0Ω	.1Ω		
V 9	12AT7	#5.5KΩ	470KΩ	0Ω	0Ω	0Ω	†10KΩ	47KΩ	0Ω	.1Ω
V 10	6AQ5	470KΩ	220Ω	.1Ω	0Ω	#3.8KΩ	†22KΩ	470KΩ		
V 11	12AU7	#600KΩ	♦220KΩ	♦0Ω	0Ω	0Ω	47KΩ	47KΩ	1 Meg.	.1Ω
V 12	12AX7	470KΩ	470KΩ	0Ω	0Ω	0Ω	†35KΩ	1 Meg.	0Ω	.1Ω
V 13	6AT6	1.3 Meg.	2KΩ	.1Ω	0Ω	1 Meg.	1 Meg.	†220KΩ		
V 14	6BJ6	0Ω	68Ω	.1Ω	0Ω	†10KΩ	†10KΩ	0Ω		
V 15	6BH6	47KΩ	0Ω	.1Ω	0Ω	†47KΩ	†47KΩ	0Ω		
V 16	6T8	Inf.	20KΩ	Inf.	.1Ω	0Ω	0Ω	0Ω	15 Meg.	†220KΩ
V 17	6AQ5	470KΩ	270Ω	.1Ω	0Ω	†1.4KΩ	†1KΩ	470KΩ		
V 18	12AT7	†10KΩ	100KΩ	0Ω	0Ω	0Ω	†25KΩ	4.7 Meg.	0Ω	.1Ω
V 19	12AU7	†2.5KΩ	♦2.2Meg.	♦3.5KΩ ♦500Ω	0Ω	0Ω	†2.6Meg. †1.4Meg.	♦1 Meg.	♦0Ω	.1Ω
V 20	6AL5	1 Meg.	1.5 Meg.	.1Ω	0Ω	10Ω	0Ω	1.5 Meg.		
V 21	6AC7	0Ω	.1Ω	0Ω	1.5 Meg.	10Ω	†20KΩ	0Ω	†23KΩ	
V 22	6AQ5	27KΩ	10Ω	.1Ω	0Ω	†5KΩ	†10KΩ	27KΩ		
V 23	6BG6G	Inf.	0Ω	♦100Ω	Inf.	♦220KΩ	#13KΩ	.1Ω	†4.7KΩ	TOP CAP #8KΩ
V 24	5V4G	Inf.	7KΩ	Inf.	#260Ω	Inf.	#260Ω	Inf.	7KΩ	
V 25	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf. *	TOP CAP #8KΩ
V 26	5U4G	0Ω	15KΩ	Inf.	♦21Ω	60KΩ	♦19Ω	90KΩ	15KΩ	
V 27	5V4G	0Ω	90KΩ	20KΩ	♦19Ω	Inf.	♦21Ω	Inf.	90KΩ	
V 28	10BP4	0Ω	1.5 Meg.	PIN 10 #350Ω	PIN 11 #60KΩ	PIN 12 .1Ω				
† V 29	12AT7	▲6KΩ	400KΩ	83Ω	0Ω	0Ω	▲13KΩ	450KΩ	0Ω	.1Ω
V30A	6BE6	22KΩ	1Ω	0Ω	.1Ω	▲5KΩ	▲12KΩ	2 Meg.		
† V30B	6BE6	22KΩ	1Ω	0Ω	.1Ω	▲5KΩ	▲12KΩ	0Ω		
V31	6BA6	1.2 Meg.	0Ω	0Ω	.1Ω	▲4KΩ	34KΩ	68Ω		
† V32	6BA6	.5Ω	0Ω	0Ω	.1Ω	▲3.5KΩ	▲33KΩ	68Ω		
† V33	6AL5	Inf.	Inf.	0Ω	1Ω	0Ω	0Ω	15KΩ		
V34	6AV6	10 Meg.	0Ω	0Ω	.1Ω	400KΩ	150KΩ	▲420KΩ		
V35	6V6GT	0Ω	.1Ω	▲600Ω	▲200Ω	400KΩ	250KΩ	0Ω	270Ω	
V36	5Y3GT	Inf.	120KΩ	Inf.	85Ω	Inf.	80Ω	Inf.	120KΩ	

† MEASURED FROM PIN 8 OF V26.
# MEASURED FROM PIN 8 O F V27.
† TAKEN IN FM POSITION.
♦ MEASURED FROM PIN 8 OF V19.
▲ MEASURED FROM PIN 8 OF V36

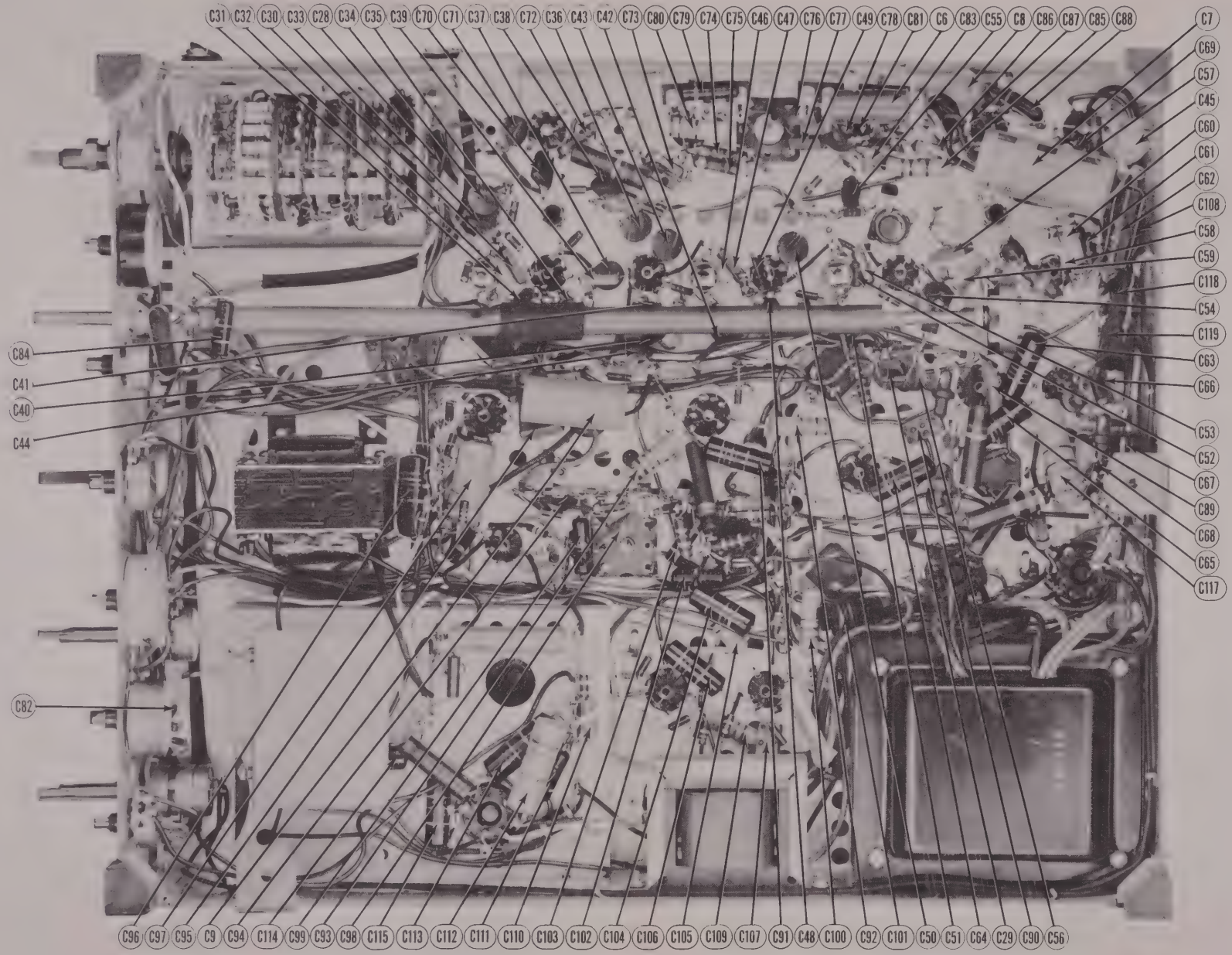
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



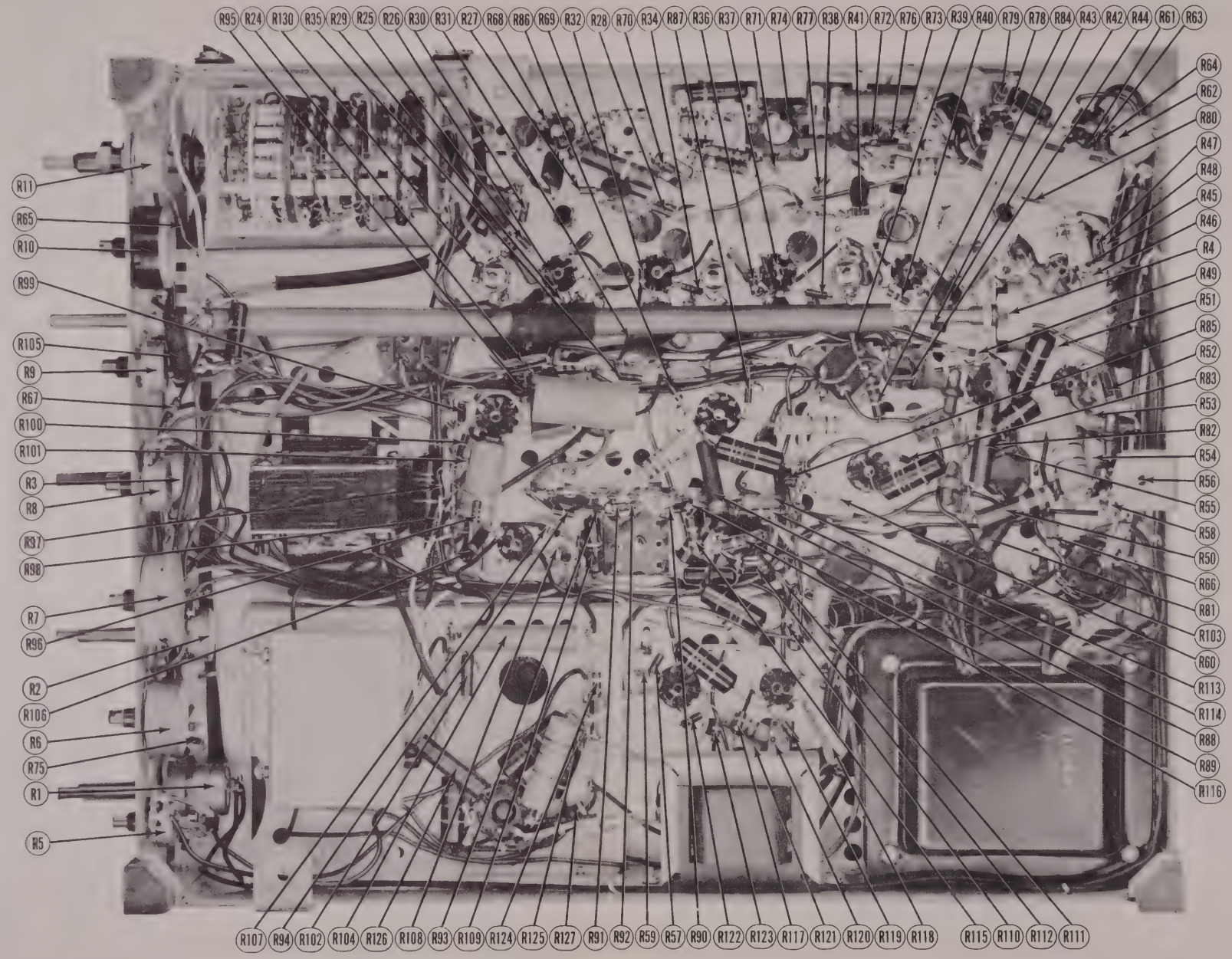
CTOR AND ALIGNMENT IDENTIFICATION



RADIO CHASSIS - BOTTOM VIEW - RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

RADIO CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		WESTINGHOUSE PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6C4	6C4	6BG	
V4	1st Video IF	6BH6	6BH6	7CM	
V5	2nd Video IF	6BH6	6BH6	7CM	
V6	3rd Video IF	6BH6	6BH6	7CM	
V7	4th Video IF	6BH6	6BH6	7CM	
V8	Video Det.-AGC Rectifier	6AL5	6AL5	6BT	
V9	Video Amp.-1st Sync. Amp.	12AT7	12AT7	9A	
V10	Video Output	6AQ5	6AQ5	7BZ	
V11	DC Restorer-Hor. Disch.	12AU7	12AU7	9A	
V12	Noise Clipper-Sync. Sep.	12AX7	12AX7	9A	
V13	AGC Amp.	6AT6	6AT6	7BT	
V14	1st Sound IF	6BJ6	6BJ6	7CM	
V15	2nd Sound IF	6BH6	6BH6	7CM	
V16	Ratio Det.-AF Amp.	6T8	6T8	9E	
V17	Audio Output	6AQ5	6AQ5	7BZ	
V18	2nd Sync. Amp.	12AT7	12AT7	9A	
V19	Vert. Osc.-Vert. Amp.	12AU7	12AU7	9A	
V20	Hor. Sync. Disc.	6AL5	6AL5	6BT	
V21	Hor. AFC	6AC7	6AC7	8N	
V22	Hor. Osc.	6AQ5	6AQ5	7BZ	
V23	Hor. Output	6BG6G	6BG6G	5BT	
V24	Damper	5V4G	5V4G	5L	
V25	HV Rectifier	1B3GT	1B3GT	3C	
V26	LV Rectifier	5U4G	5U4G	5T	
V27	LV Rectifier	5V4G	5V4G	5L	
V28	Picture Tube	10BP4	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	500	V-5894	AF88K	UP4450		TVL-20	● Filter
B	40	500						▲ Filter
C2A	500	6	V-5893	PRS6/500	UP7BJ934		TVL-10	▲ Hor. Cent. Cont. Bypass
B	1000	6		PRS6/1000				● Vert. Cent. Cont. Bypass
C3A	80	400	V-5892	AF168I30B	UP11CJ1046		TVL-24	● Filter
B	40	400						■ Filter
C	150	50						▲ Vert. Output Cath. Bypass
C4A	80	350	V-5991	AF16222H	UP11DJ1047		TVL-47	● Filter
B	10	350					TVA-25	■ V. Amp. Screen Bypass
C	10	350						▲ Output Decoupling
D	10	350						Decoupling
C5A	10	400	V-5897	AF333J	UP3145		TVL-15	■ Vert. Output Decoupling
B	30	400						▲ Decoupling
C6	2	50	V-4880	E26A90	BBR2-50T		TVA-12	Stabilizing Cap.
C7	30	450	V-6570	PRS450/30	BR3045A		TVA-23	Output Decoupling
C8	20	25	V-3236	PRS25/25	BR202A		TVA-6	Output Cathode Bypass
C9	10	350	V-5985	PRS350/12	BR1235A		TVA-21	Decoupling
C10	220	500		1468-00025	5W5T25	GP2K-220	1FM-325	Ant. Coupling
C11	220	500		1468-00025	5W5T25	GP2K-220	1FM-325	Ant. Coupling
C12	25					GP1K-25		RF Coupling
C13	680					GP2K-680		AGC Filter
C14	680					GP2K-680		RF Screen Bypass
C15	680					GP2K-680		RF Filament Bypass
C16	680					GP2K-680		RF Bypass
C17	25					GP1K-25		RF Coupling
C18	.47							RF Coupling
C19	.47							RF Coupling
C20	1.5					NPOK-1.5		RF Coupling
C21	15					GP1K-15		RF Coupling
C22	5000					811-005	29C1	Mixer Screen Bypass
C23	.68							Osc. Coupling
C24	680					GP2K-680		Osc. Feedback
C25	3					NPOK-3		Fixed Trimmer
C26	680					GP2K-680		Osc. Filament Bypass
C27	680					GP2K-680		RF Bypass
C28	5000		V-5596	1467-005	1D5D5	811-005	29C1	Filament Bypass
C29	5000		V-5596	1467-005	1D5D5	811-005	29C1	RF Bypass
C30	270	500	RCM20B271M	1468-00025	5W5T25	GP2K-270	1FM-325	I F Coupling
C31	5000		V-5596	1467-005	1D5D5	811-005	29C1	RF Bypass
C32	50			1469-00005	5R5Q5	N750L-47	MS-45	Fixed Trimmer
C33	5000		V-5596	1467-005	1D5D5	811-005	29C1	AGC Filter
C34	5000		V-5596	1467-005	1D5D5	811-005	29C1	AGC Filter
C35	5000		V-5596	1467-005	1D5D5	811-005	29C1	1st V. IF Screen Bypass
C36	5000		V-5596	1467-005	1D5D5	811-005	29C1	1st V. IF Plate Decoupling
C37	5000		V-5596	1467-005	1D5D5	811-005	29C1	1st V. IF Fil. Bypass
C38	5000		V-5596	1467-005	1D5D5	811-005	29C1	Filament Bypass
C39	270	500	RCM20B271M	1468-00025	5W5T25	GP2K-270	1FM-325	I F Coupling
C40	5000		V-5596	1467-005	1D5D5	811-005	29C1	AGC Filter
C41	5000		V-5596	1467-005	1D5D5	811-005	29C1	2nd V. IF Screen Bypass
C42	5000		V-5596	1467-005	1D5D5	811-005	29C1	2nd V. IF Decoupling
C43	5000		V-5596	1467-005	1D5D5	811-005	29C1	2nd V. IF Fil. Bypass
C44	5000		V-5596	1467-005	1D5D5	811-005	29C1	AGC Filter
C45	.5	400	V-6066-4504M	484-5	GT4P5		68P23	AGC Filter
C46	82							Fixed Trimmer
C47	270	500	RCM20B271M	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C48	5000		V-5596	1467-005	1D5D5	811-005	29C1	3rd V. IF Screen Bypass
C49	5000		V-5596	1467-005	1D5D5	811-005	29C1	3rd V. IF Cath. Bypass
C50	5000		V--5596	1467-005	1D5D5	811-005	29C1	3rd V. IF Fil. Bypass
C51	5000		V-5596	1467-005	1D5D5	811-005	29C1	3rd V. IF Decoupling

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C52	82							Fixed Trimmer
C53	270	500	RCM20B271M	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C54	5000		V-5596	1467-005	1D5D5	811-005	29C1	4th V. IF Screen Bypass
C55	5000		V-5596	1467-005	1D5D5	811-005	29C1	4th V. IF Cath. Bypass
C56	5000		V-5596	1467-005	1D5D5	811-005	29C1	4th V. IF Decoupling
C57	270	500	RCM20B271M	1468-00025	5W5T25	GP2K-270	1FM-325	IF Coupling
C58	5		R2CC30CK050D	1468-000005	5W5V5	NPOK-5	MS-55	V. Diode Filter
C59	10	500	RCM20B100M	1468-00001	5W5Q1	GP1K-10	MS-41	V. Diode Filter
C60	.001	600	V-6023-6102M	P688-001	GT6D1	GP2L-001	TM-21	AGC Filter
C61	22	500	RCM20B220M	1468-000025	5W5Q25	GP1K-22	MS-425	AGC Filter
C62	.1	400	V-6023-4104M	P488-1	GT4P1		TM-1	AGC Filter
C63	.047	400	V-6023-4503M	P488-047	GT4S5		TM-15	Video Coupling
C64	.047	400	V-6023-4503M	P488-047	GT4S5		TM-15	Video Coupling
C65	.047	400	V-6023-4503M	P488-047	GT4S5		TM-15	Video Coupling
C66	470	500	RCM20B471M	1468-0005	5W5T5	GP2K-470	1FM-35	V. Amp. Cath. Bypass
C67	.047	400	V-6023-4503M	P488-047	GT4S5		TM-15	Video Coupling
C68	.047	400	V-6023-4503M	P488-047	GT4S5		TM-15	Video Coupling
C69	.01	400	V-6023-4103M	P488-01	GT4S1	GP2-335-01	TM-11	AGC Coupling
C70	220	500	RCM20B221M			GP2K-220		Fixed Trimmer
C71	5000		V-5596	1467-005	1D5D5	811-005	29C1	1st S. IF Cath. Bypass
C72	1500		R5CC26ZY152M	1467-0015	1W5D15	GP2L-0015	1FM-215	1st S. IF Decoupling
C73	47	500	RCM20B470K	1468-00005	5W5Q5	GP1K-47	1FM-45	2nd S. IF Grid Filter
C74	1500		R5CC26ZY152M	1467-0015	1W5D15	GP2L-0015	1FM-215	2nd S. IF Decoupling
C75	1500		R5CC26ZY152M	1467-0015	1W5D15	GP2L-0015	1FM-215	2nd S. IF Decoupling
C76	47	500	RCM20B470K	1468-00005	5W5Q5	GP1K-47	1FM-45	Diode Load Cap. †
C77	47	500	RCM20B470K	1468-00005	5W5Q5	GP1K-47	1FM-45	Diode Load Cap. †
C78	5000		V-5596	1467-005	1D5D5	811-005	29C1	RF Bypass
C79	.001	600	V-6023-6102M	P688-001	GT6D1	GP2L-001	TM-21	De-emphasis
C80	.01	400	V-6023-4103M	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C81	.01	400	V-6023-4103M	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C82	.01	400	V-6023-4103M	P488-01	GT4S1	GP2-335-01	TM-11	Tone Compensation
C83	470	500	RCM20B471M	1468-0005	5W5T5	GP2K-470	1FM-35	AF Plate Bypass
C84	.01	400	V-6023-4103M	P488-01	GT4S1	GP2-335-01	TM-11	Tone Compensation
C85	.01	400	V-6023-4103M	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C86	470		R5CC21ZY471M	1468-0005	5W5T5	GP2K-470	1FM-35	Output Grid Bypass
C87	47		R2CC21ZY470K	1468-00005	5W5Q5	GP1K-47	1FM-45	Output Grid Bypass
C88	.0022	600	V-6023-6202M	P688-0022	GT6D2	GP2M-0022	TM-22	Output Plate Bypass
C89	270	500	RCM20B271M	1468-00025	5W5T25	GP2K-270	1FM-325	1st Sync. Amp. Plate Bypass
C90	270	500	RCM20B271M	1468-00025	5W5T25	GP2K-270	1FM-325	Sync. Coupling
C91	.047	400	V-6023-4103M	P488-047	GT4S5		TM-15	Sync. Coupling
C92	.01	400	V-6023-4103M	P488-01	GT4S1	GP2-335-01	TM-11	Sync. Coupling
C93	.01	400	V-6023-4103M	P488-01	GT4S1	GP2-335-01	TM-11	Vert. Sync. Coupling
C94 A	2000		V-6060-1	P688-002	GT6D2	GP2M-002	TM-22	Integrator Net.
B	5000			P688-005	GT6D5	GP2M-005	TM-25	Integrator Net.
C	5000			P688-005	GT6D5	GP2M-005	TM-25	Integrator Net.
C95	4700	500	RCM30B472J	1467-005	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C96	.068	400	V-6023-4683M	P488-068				Vert. Discharge
C97	.25	400	V-6066-4254M	P488-25	GT4P25		TC-2	Vert. Sweep Coupling
C98	68	500	RCM20B680M	1469-00007	5W5Q7	GP1K-68	MS-47	Hor. Sync. Coupling
C99	.015	200	V-6023-2153K	P288-015	GT6S15			Fixed Trimmer
C100	.0047	400	V-6023-4402M	P688-0047	GT6D5	GP2M-0047	TM-25	AFC Filter ‡
C101	.047	400	V-6023-4103M	P488-047	GT4S5		TM-15	AFC Filter
C102	.015	200	V-6023-2153K	P288-015	GT6S15			Phase Shifter
C103	.0047	400	V-6023-4402M	P688-0047	GT6D5	GP2M-0047	TM-25	AFC Coupling ‡
C104	.047	400	V-6023-4103M	P488-047	GT4S5		TM-15	AFC Screen Bypass
C105	.0047	400	V-6023-4402M	P688-0047	GT6D5	GP2M-0047	TM-25	Hor. Osc. Grid Cap. ‡
C106	.047	400	V-6023-4103M	P488-047	GT4S5		TM-15	Hor. Osc. Screen Bypass
C107	390	500	RCM20B391M	1468-0004	5W5T4	GP2K-390	1FM-34	Hor. Osc. Coupling
C108	.01	400	V-6023-4103M	P488-01	GT4S1	GP2-335-01	TM-11	Hor. Osc. Coupling
C109	.01	400	V-6023-4103M	P488-01	GT4S1	GP2-335-01	TM-11	Hor. Osc. Coupling
C110	680	500	RCM20B681M		1W5T7	GP2K-680	1FM-37	Hor. Discharge
C111	.001	600	V-6023-6102M	P688-001	GT6D1	GP2L-001	TM-21	Hor. Sweep Coupling
C112	.047	600	V-6023-6503M	P688-047	GT6S5		TM-15	Hor. Output Screen Bypass
C113	.1	400	V-6023-4104M	P488-1	GT4P1		TM-1	Hor. Output Cath. Bypass
C114	.033	600	V-6023-6333M	P688-033				Damper Filter
C115	.047	600	V-6023-6503M	P688-047	GT6S5		TM-15	Damper Filter
C116	500	10000	V-5895					HV Filter
C117	.1	400	V-6023-4104M	P488-1	GT4P1		TM-1	Pic. Tube Cath. Decoupling
C118	.01	600	V-5040-15	P688-01	GT6S1		TM-11	Line Filter
C119	.01	600	V-5040-15	P688-01	GT6S1		TM-11	Line Filter

† When either item C76 or C77 are replaced, replace both with capacitors of equal value.
‡ Some models use .004MFD in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA WESTINGHOUSE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	2 Meg.	1/2		B13-139X *	V-6305	Volume control, front, tapped at 500KΩ
B	1 Meg.	1/2		B11-137 *		Tone control, rear
C	Shaft End		V-6305	E202 *		Attach per instructions in "Concentrikit"
D	Switch			76-1 *		Attach per instructions in "Concentrikit"
R2A	2 Meg.	1/2		B11-139 *	V-6304	Vert. hold control, front
B	1 Meg.	1/2	V-6304	B11-137 *		Horiz. hold control, rear
C	Shaft End			E202 *		Attach per instructions in "Concentrikit"
R3	50KΩ	1/2	V-6306	Q11-123	M-44-S	Brightness control
R4	2500Ω	1/2	V-5915			Contrast control
R5A	25KΩ	1/2	V-5910	Q11-120	AM-40-S	Horiz. linearity control
B	Shaft		Not Req.	SQ	KSS-3 #	Attach to R5A per instructions
R6	50Ω	2	V-5911	W-50 #	43-50 #	Horiz. centering control, Wire Wound
R7	50Ω	2	V-5913	W-50X25 #	43-50 CT #	Vert. centering control tapped at 25Ω
R8A	2.5 Meg.	1/2	V-5909	Q11-239	AM-84-S	Height control
B	Shaft		Not Req.	SQ	KSS-3#	Attach to R8A per instructions
R9A	3000Ω	1/2	V-5968	Q11-112	AM-15-S	Vert. linearity control
B	Shaft		Not Req.	SQ	KSS-3#	Attach to R9A per instructions
R10	250Ω	4	V-5908		10-250	Focus control, Wire Wound
R11A	5000Ω	1/2	V-5907	Q11-114	AM-19-S	Sensitivity control
B	Shaft		Not Req.	SQ	KSS-3#	Attach to R11A per instructions

File slot in shaft to duplicate original.
* Additional parts to be used with "Concentrikit"

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	WESTINGHOUSE PART No.	IRC PART No.	ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED.
R12	100KΩ	½	RC20AE104M		Ant. Shunt
R13	100KΩ	½	RC20AE104M		Ant. Shunt
R14	1000Ω	½		BTS-1000	AGC Filter
R15	33KΩ	2			RF Screen
R16	10KΩ	1			RF Plate
R17	18KΩ 10%	½			RF Coil Shunt
R18	4700Ω	2			Mixer Coil Shunt
R19	1 Meg.	½			Mixer Grid
R20	82KΩ	2			Mixer Screen
R21	5600Ω	1			Osc. Plate
R22	22KΩ	½			Osc. Grid
R23	470Ω	½		BTS-470	Osc. Cathode
R24	1000Ω	1	RC30AE102M	BTS-1000	Osc. Plate Decoupling
R25	8200Ω 10%	½	RC20AE822K		1st Video IF Grid
R26	82Ω 10%	½	RC20AE820K		1st Video IF Cathode
R27	2200Ω 10%	½	RC20AE222K	BTS-2200	1st Video IF Plate
R28	1000Ω	½	RC20AE102M	BTS-1000	1st Video IF Plate Decoupling
R29	33KΩ	½	RC20AE333M		1st Video IF Screen
R30	10KΩ	½	RC20AE103M		AGC Network
R31	8200Ω 10%	½	RC20AE822K		2nd Video IF Grid
R32	82Ω 10%	½	RC20AE820K		2nd Video IF Cathode
R33	33KΩ	½	RC20AE333M		2nd Video IF Screen
R34	1000Ω	½	RC20AE102M	BTS-1000	2nd Video IF Decoupling
R35	10KΩ	½	RC20AE103M		AGC Network
R36	6800Ω 10%	½	RC20AE682K		3rd Video IF Grid
R37	68Ω 10%	½	RC20AE680K		3rd Video IF Cathode
R38	33KΩ	½	RC20AE333M		3rd Video IF Screen
R39	1000Ω	½	RC20AE102M	BTS-1000	3rd Video IF Decoupling
R40	3900Ω 10%	½	RC20AE392K	BTS-3900	4th Video IF Grid
R41	68Ω 10%	½	RC20AE680K		4th Video IF Cathode
R42	5600Ω 10%	1	RC30AE562K		4th Video IF Plate
R43	33KΩ	½	RC20AE333M		4th Video IF Screen
R44	1000Ω	½	RC20AE102M	BTS-1000	4th Video IF Decoupling
R45	82KΩ 10%	½	RC20AE823K	BTS-82K	AGC Rect. Diode Load
R46	470KΩ	½	RC20AE474M	BTS-470K	AGC Filter
R47	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Voltage Divider
R48	1 Meg.	½	RC20AE105M	BTS-1 Meg.	AGC Amp. Grid
R49	470KΩ	½	RC20AE474M	BTS-470K	Video Amp. Grid
R50	4700Ω 5%	2	RC40AE472J	BT-2-4700-5%	Video Amp. Plate
R51	470KΩ	½	RC20AE474M	BTS-470K	Video Output Grid
R52	220Ω 10%	1	RC30AE221K	BW-1-220	Video Output Cathode
R53	10KΩ 10%	½	RC20AE103K	BTS-10K	Peaking Coil Shunt
R54	3300Ω	5	V-5924-1		Video Output Plate,Wire Wound
R55	22KΩ	½	RC20AE223M	BTS-22K	Video Output Screen
R56	10KΩ	½	RC20AE103M	BTS-10K	Sync. Isolation
R57	1 Meg.	½	RC20AE105M	BTS-1 Meg.	DC Restorer Load
R58	470KΩ	½	RC20AE474M	BTS-470K	Picture Tube Grid
R59	47KΩ	½	RC20AE473M	BTS-47K	1st Sync. Amp. Grid
R60	470KΩ	½	RC20AE474M	BTS-470K	Noise Clipper Load
R61	1 Meg.	½	RC20AE105M	BTS-1 Meg.	AGC Network
R62	1 Meg.	½	RC20AE105M	BTS-1 Meg.	AGC Network
R63	220KΩ	½	RC20AE224M	BTS-220K	AGC Amp. Plate
R64	82KΩ 10%	1	RC30AE823K	BTA-82K	AGC Amp. Cathode
R65	1000Ω	½	RC20AE102M	BTS-1000	Voltage Divider
R66	470Ω	1	RC30AE471M	BTA-470	Decoupling
R67	68KΩ	½	RC20AE683M	BTS-68K	Voltage Divider
R68	68Ω 10%	½	RC20AE680K		1st Sound IF Cathode
R69	10KΩ 10%	2	RC40AE103K		1st Sound IF Decoupling
R70	47KΩ	½	RC20AE473M		2nd Sound IF Grid
R71	47KΩ	½	RC20AE473M	BTS-47K	2nd Sound IF Decoupling
R72	10KΩ 5%	½	RC20AE103J	BTS-10K-5%	Ratio Det. Diode Load
R73	10KΩ 5%	½	RC20AE103J	BTS-10K-5%	Ratio Det. Diode Load
R74	68KΩ	½	RC20AE683M	BTS-68K	De-emphasis
R75	47KΩ	½	RC20AE473M	BTS-47K	Tone Compensation
R76	15 Meg.	½	RC20AE156M	BTS-15 Meg.	AF Grid
R77	220KΩ	½	RC20AE224M	BTS-220K	AF Plate
R78	470KΩ	½	RC20AE474M	BTS-470K	Output Grid
R79	270Ω 10%	1	RC30AE271K	BW-1-270	Output Cathode
R80	33Ω	½	RC20AE330M		Parasitic Supp.
R81	1000Ω	2	RC40AE102M	BW-2-1000	Filter
R82	10KΩ 10%	2	RC40AE103K	BT-2-10K	1st Sync. Amp. Plate
R83	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Sync. Sep. Grid
R84	68KΩ 10%	1	RC30AE683K	BTA-68K	Sync. Sep. Plate
R85	47KΩ	½	RC20AE473M	BTS-47K	Voltage Divider
R86	100KΩ	½	RC20AE104M	BTS-100K	2nd Sync. Amp. Grid
R87	4.7 Meg.	½	RC20AE475M	BTS-4.7 Meg.	2nd Sync. Amp. Grid
R88	10KΩ 10%	2	RC40AE103K	BT-2-10K	2nd Sync. Amp. Plate
R89	39KΩ 10%	1	RC30AE393K	BTA-39K	2nd Sync. Amp. Plate
R90	27KΩ 10%	½	RC20AE273K	BTS-27K	Voltage Divider
R91	10KΩ 10%	½	RC20AE103K	BTS-10K	Voltage Divider
R92	22KΩ	½	RC20AE223M	BTS-22K	Integrator
R93	8200Ω 10%	½	RC20AE822K	BTS-8200	Integrator
R94	8200Ω 10%	½	RC20AE822K	BTS-8200	Integrator
R95	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Vert. Osc. Grid
R96	6.8 Meg.	½	RC20AE685M	BTS-6.8 Meg.	Voltage Divider
R97	100KΩ	½	RC20AE104M	BTS-100K	Voltage Divider
R98	1.5 Meg. 10%	½	RC20AE155K	BTS-1.5 Meg.	Vert. Osc. Plate
R99	470Ω	½	RC20AE471M	BTS-470	Vert. Output Cathode
R100	2.2 Meg.	½	RC20AE225M	BTS-2.2 Meg.	Vert. Output Grid
R101	3300Ω	½	RC20AE332M	BTS-3300	Vert. Peaking
R102	2200Ω	1	RC30AE222M	BTA-2200	Vert. Output Decoupling
R103	68KΩ	½	RC20AE683M	BTS-68K	Vert. Osc. Plate Decoupling
R104	250Ω	20	V-5922	DG-250	Bias Network-Wire Wound
R105	100Ω	2	RC40AE101M	BW-2-100	Focus Coil Shunt
R106	10Ω 10%	1	RC30AE100K	BW-1-10	Bias Network
R107	470KΩ	½	RC20AE474M	BTS-470K	Horiz. Sync. Disc. Load
R108	470KΩ	½	RC20AE474M	BTS-470K	Horiz. Sync. Disc. Load
R109	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Horiz. Sync. Disc. Load
R110	470KΩ	½	RC20AE474M	BTS-470K	Horiz. AFC Filter Network
R111	560Ω 10%	½	RC20AE561K	BTS-560	Horiz. AFC Grid

RESI

ITEM No.	RATING		REPLACEMENT DATA	
	RESISTANCE	WATTS	Westinghouse PART No.	IRC PART N
R112	10Ω 10%	½	RC20AE100K	
R113	47KΩ	1	RC30AE473M	BTA-47K
R114	39KΩ 10%	1	RC30AE393K	BTA-39K
R115	39KΩ 10%	1	RC30AE393K	BTA-39K
R116	27KΩ 10%	1	RC30AE273K	BTA-27K
R117	27KΩ 10%	½	RC20AE273K	BTS-27K
R118	5000Ω	5	V-5925	AB-5000
R119	10KΩ	½	RC20AE103M	BTS-10K
R120	6800Ω	½	RC20AE682M	BTS-680
R121	560Ω 10%	½	RC20AE561K	BTS-560
R122	220KΩ	½	RC20AE224M	BTS-220
R123	680KΩ	½	RC20AE684M	BTS-680
R124	3900Ω 10%	½	RC20AE392K	BTS-390
R125	220KΩ	½	RC20AE224M	BTS-220
R126	100Ω	2	RC40AE101M	BW-2-10
R127	4700Ω 10%	2	RC40AE472K	BT-2-47
R128	7800Ω	50	V-5963	
R129	470KΩ	1	RC30AE474M	
R130	8200Ω	½	RC20AE822K	

TRANSF

ITEM No.	RATING				WEST
	PRI.	SEC. 1	SEC. 2	SEC. 3	PA
T1	117VAC at 2.25A	650VCT .325ADC	5VAC at 3A	5VAC at 2A	V-5
			SEC. 4	SEC. 5	
			5VAC at 2A	12.6VCT at 4A	

TRANSFORM

ITEM No.	RATING			REF
	DC RESISTANCE		WESTINGHOUSE PART No.	STANC PART N
	PRI.	SEC.		
T2	42Ω CT	36Ω Tap. at 9Ω	V-5935	
T3	178Ω	910Ω	V-5937	A-8121
T4	330Ω Tap. at 180Ω	SEC. 1 8.9Ω Tap. at .7Ω SEC. 2 0Ω	V-5934	A-8117
T5	560Ω	8.5Ω	V-5938	A-8115
T6A B	13.8Ω 63Ω		V-5946 ⑤	DY-1
T6C D			V-6073 ⑥	
T6E F			V-6612 ⑦	
T7	240Ω		V-5900	FC-10

⑤ Used in chassis V-2130-11DX
⑥ Used in chassis #V-2130-1
⑦ Used in chassis V-2130-31DX, V-2130-32DX

TRANSFORM

ITEM No.	RATING				WESTING-HOUSE PART No.	S F
	IMPEDANCE		DC RES.			
	PRI.	SEC.	PRI.	SEC.		
T8A B	5.2KΩ 5.5KΩ	4Ω 3.6Ω	560Ω 440Ω	.6Ω 1.1Ω	V-6480 ④	A- A-

ITEM No.	RATINGS		REPLACE
	FIELD RES.	V. C. IMP.	WESTING-HOUSE PART No.
SP1A B	106Ω PM	4Ω	V-6268 ② ③
	CONE DIA.	V. C. DIA.	
SP2A B	9 1/2"	3/4"	② ③

TV PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	WESTINGHOUSE PART No.	IRC PART No.	ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED.
R12	100KΩ	½	RC20AE104M		Ant. Shunt
R13	100KΩ	½	RC20AE104M		Ant. Shunt
R14	1000Ω	1		BTS-1000	AGC Filter
R15	33KΩ	½			RF Screen
R16	10KΩ	1			RF Plate
R17	18KΩ 10%	½			RF Coil Shunt
R18	4700Ω	½			Mixer Coil Shunt
R19	1 Meg.	½			Mixer Grid
R20	82KΩ	½			Mixer Screen
R21	68000Ω	½			Osc. Plate
R22	22KΩ	½			Osc. Grid
R23	470Ω	½		BTS-470	Osc. Cathode
R24	1000Ω	1	RC30AE102M	BTS-1000	Osc. Plate Decoupling
R25	8200Ω 10%	½	RC20AE822K		1st Video IF Grid
R26	82Ω 10%	½	RC20AE820K		1st Video IF Cathode
R27	2200Ω 10%	½	RC20AE222K	BTS-2200	1st Video IF Plate
R28	1000Ω	½	RC20AE102M	BTS-1000	1st Video IF Plate Decoupling
R29	33KΩ	½	RC20AE333M		1st Video IF Screen
R30	10KΩ	½	RC20AE103M		AGC Network
R31	8200Ω 10%	½	RC20AE822K		2nd Video IF Grid
R32	82Ω 10%	½	RC20AE820K		2nd Video IF Cathode
R33	33KΩ	½	RC20AE333M		2nd Video IF Screen
R34	1000Ω	½	RC20AE102M	BTS-1000	2nd Video IF Decoupling
R35	10KΩ	½	RC20AE103M		AGC Network
R36	6800Ω 10%	½	RC20AE682K		3rd Video IF Grid
R37	68Ω 10%	½	RC20AE680K		3rd Video IF Cathode
R38	33KΩ	½	RC20AE333M		3rd Video IF Screen
R39	1000Ω	½	RC20AE102M	BTS-1000	3rd Video IF Decoupling
R40	3900Ω 10%	½	RC20AE392K	BTS-3900	4th Video IF Grid
R41	68Ω 10%	½	RC20AE680K		4th Video IF Cathode
R42	5600Ω 10%	1	RC30AE562K		4th Video IF Plate
R43	33KΩ	½	RC20AE333M		4th Video IF Screen
R44	1000Ω	½	RC20AE102M	BTS-1000	4th Video IF Decoupling
R45	82KΩ 10%	½	RC20AE823K	BTS-82K	AGC Rect. Diode Load
R46	470KΩ	½	RC20AE474M	BTS-470K	AGC Filter
R47	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Voltage Divider
R48	1 Meg.	½	RC20AE105M	BTS-1 Meg.	AGC Amp. Grid
R49	470KΩ	½	RC20AE474M	BTS-470K	Video Amp. Grid
R50	4700Ω 5%	2	RC40AE472J	BT-2-4700-5%	Video Amp. Plate
R51	470KΩ	½	RC20AE474M	BTS-470K	Video Output Grid
R52	220Ω 10%	1	RC30AE221K	BW-1-220	Video Output Cathode
R53	10KΩ 10%	½	RC20AE103K	BTS-10K	Peaking Coil Shunt
R54	3300Ω	5	V-5924-1		Video Output Plate, Wire Wound
R55	22KΩ	½	RC20AE223M	BTS-22K	Video Output Screen
R56	10KΩ	½	RC20AE103M	BTS-10K	Sync. Isolation
R57	1 Meg.	½	RC20AE105M	BTS-1 Meg.	DC Restorer Load
R58	470KΩ	½	RC20AE474M	BTS-470K	Picture Tube Grid
R59	47KΩ	½	RC20AE473M	BTS-47K	1st Sync. Amp. Grid
R60	470KΩ	½	RC20AE474M	BTS-470K	Noise Clipper Load
R61	1 Meg.	½	RC20AE105M	BTS-1 Meg.	AGC Network
R62	1 Meg.	½	RC20AE105M	BTS-1 Meg.	AGC Network
R63	220KΩ	½	RC20AE224M	BTS-220K	AGC Amp. Plate
R64	82KΩ 10%	1	RC30AE823K	BTA-82K	AGC Amp. Cathode
R65	1000Ω	½	RC20AE102M	BTS-1000	Voltage Divider
R66	470Ω	1	RC30AE471M	BTA-470	Decoupling
R67	68KΩ	½	RC20AE683M	BTS-68K	Voltage Divider
R68	68Ω 10%	½	RC20AE680K		1st Sound IF Cathode
R69	10KΩ 10%	2	RC40AE103K		1st Sound IF Decoupling
R70	47KΩ	½	RC20AE473M		2nd Sound IF Grid
R71	47KΩ	½	RC20AE473M	BTS-47K	2nd Sound IF Decoupling
R72	10KΩ 5%	½	RC20AE103J	BTS-10K-5%	Ratio Det. Diode Load
R73	10KΩ 5%	½	RC20AE103J	BTS-10K-5%	Ratio Det. Diode Load
R74	68KΩ	½	RC20AE683M	BTS-68K	De-emphasis
R75	47KΩ	½	RC20AE473M	BTS-47K	Tone Compensation
R76	15 Meg.	½	RC20AE156M	BTS-15 Meg.	AF Grid
R77	220KΩ	½	RC20AE224M	BTS-220K	AF Plate
R78	470KΩ	½	RC20AE474M	BTS-470K	Output Grid
R79	270Ω 10%	1	RC30AE271K	BW-1-270	Output Cathode
R80	33Ω	½	RC20AE330M		Parasitic Supp.
R81	1000Ω	2	RC40AE102M	BW-2-1000	Filter
R82	10KΩ 10%	2	RC40AE103K	BT-2-10K	1st Sync. Amp. Plate
R83	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Sync. Sep. Grid
R84	68KΩ 10%	1	RC30AE683K	BTA-68K	Sync. Sep. Plate
R85	47KΩ	½	RC20AE473M	BTS-47K	Voltage Divider
R86	100KΩ	½	RC20AE104M	BTS-100K	2nd Sync. Amp. Grid
R87	4.7 Meg	½	RC20AE475M	BTS-4.7 Meg.	2nd Sync. Amp. Grid
R88	10KΩ 10%	2	RC40AE103K	BT-2-10K	2nd Sync. Amp. Plate
R89	39KΩ 10%	1	RC30AE393K	BTA-39K	2nd Sync. Amp. Plate
R90	27KΩ 10%	½	RC20AE273K	BTS-27K	Voltage Divider
R91	10KΩ 10%	½	RC20AE103K	BTS-10K	Voltage Divider
R92	22KΩ	½	RC20AE223M	BTS-22K	Integrator
R93	8200Ω 10%	½	RC20AE822K	BTS-8200	Integrator
R94	8200Ω 10%	½	RC20AE822K	BTS-8200	Integrator
R95	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Vert. Osc. Grid
R96	6.8 Meg	½	RC20AE685M	BTS-6.8 Meg.	Voltage Divider
R97	100KΩ	½	RC20AE104M	BTS-100K	Voltage Divider
R98	1.5 Meg. 10%	½	RC20AE155K	BTS-1.5 Meg.	Vert. Osc. Plate
R99	470Ω	½	RC20AE471M	BTS-470	Vert. Output Cathode
R100	2.2 Meg.	½	RC20AE225M	BTS-2.2 Meg.	Vert. Output Grid
R101	3300Ω	½	RC20AE332M	BTS-3300	Vert. Peaking
R102	2200Ω	1	RC30AE222M	BTA-2200	Vert. Output Decoupling
R103	68KΩ	½	RC20AE683M	BTS-68K	Vert. Osc. Plate Decoupling
R104	250Ω	20	V-5922	DG-250	Bias Network-Wire Wound
R105	100Ω	2	RC40AE101M	BW-2-100	Focus Coil Shunt
R106	10Ω 10%	1	RC30AE100K	BW-1-10	Bias Network
R107	470KΩ	½	RC20AE474M	BTS-470K	Horiz. Sync. Disc. Load
R108	470KΩ	½	RC20AE474M	BTS-470K	Horiz. Sync. Disc. Load
R109	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Horiz. Sync. Disc. Load
R110	470KΩ	½	RC20AE474M	BTS-470K	Horiz. AFC Filter Network
R111	560Ω 10%	½	RC20AE561K	BTS-560	Horiz. AFC Grid

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	Westinghouse PART No.	IRC PART No.	
R112	10Ω 10%	½	RC20AE100K		Horiz. AFC Cathode
R113	47KΩ	1	RC30AE473M	BTA-47K	Horiz. AFC Plate
R114	39KΩ 10%	1	RC30AE393K	BTA-39K	Horiz. AFC Plate
R115	39KΩ 10%	1	RC30AE393K	BTA-39K	Horiz. AFC Screen
R116	27KΩ 10%	1	RC30AE273K	BTA-27K	Voltage Divider
R117	27KΩ 10%	½	RC20AE273K	BTS-27K	Horiz. Osc. Grid
R118	5000Ω	5	V-5925	AB-5000	Horiz. Osc. Plate-Wire Wound
R119	10KΩ	½	RC20AE103M	BTS-10K	Horiz. Osc. Screen
R120	6800Ω	½	RC20AE682M	BTS-6800	Differentiator
R121	560Ω 10%	½	RC20AE561K	BTS-560	Differentiator
R122	220KΩ	½	RC20AE224M	BTS-220K	Horiz. Discharge Grid
R123	680KΩ	½	RC20AE684M	BTS-680K	Horiz. Discharge Plate
R124	3900Ω 10%	½	RC20AE392K	BTS-3900	Horiz. Peaking
R125	220KΩ	½	RC20AE224M	BTS-220K	Horiz. Output Grid
R126	100Ω	2	RC40AE101M	BW-2-100	Horiz. Output Cathode
R127	4700Ω 10%	2	RC40AE472K	BT-2-4700	Horiz. Output Screen
R128	7800Ω	50	V-5963		Damper Filter, Wire Wound, tapped at 1000Ω, 2000Ω and 3000Ω
R129	470KΩ	1	RC30AE474M		HV Filter
R130	8200Ω	½	RC20AE822K		1st Video IF Coil Shunt

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	WESTINGHOUSE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC at 2.25A	650VCT .325ADC	5VAC at 3A	5VAC at 2A	V-5936			
			SEC. 4	SEC. 5				
			5VAC at 2A	12.6VCT at 4A				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE		WESTINGHOUSE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.					
T2	42Ω CT	36Ω Tap. at 9Ω	V-5935				Hor. Sync. Disc. Trans.
T3	178Ω	910Ω	V-5937	A-8121	A-4000	TBO-1	Vert. Block Osc. Trans.
T4	330Ω Tap. at 180Ω	SEC. 1 8.9Ω Tap. at .7Ω SEC. 2 0Ω	V-5934	A-8117	TFB-1		Hor. Output Trans.
T5	560Ω	8.5Ω	V-5938	A-8115	A-3035	TSO-1	Vert. Output Trans.
T6A	13.8Ω		V-5946 ⑤	DY-1			Hor. Deflection Coil
B	63Ω						Vert. Deflection Coil
T6C			V-6073 ⑥				Hor. Deflection Coil
D							Vert. Deflection Coil
T6E			V-6612 ⑦				Hor. Deflection Coil
F							Vert. Deflection Coil
T7	240Ω		V-5900	FC-10			Focus Coil

⑤ Used in chassis V-2130-11DX
⑥ Used in chassis #V-2130-1
⑦ Used in chassis V-2130-31DX, V-2130-32DX

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		WESTING-HOUSE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T8A	5.2KΩ	4Ω	560Ω	.6Ω	V-6480 ④	A-3849	A-2902	RO-9	④ Used in models having PM speakers.
B	5.5KΩ	3.6Ω	440Ω	1.1Ω		A-3877	A-2930	RO-9 ⑧	⑧ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	WESTING-HOUSE PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	106Ω	4Ω	V-6268 ② ③		10E ①	① Supplied on order. State field current and resistance. ② Used in chassis # V-2130-11DX and V-2130-12DX ③ Used in chassis #V-2130-21DX, V-2130-22DX, V-2130-31DX and V-2130-32DX
B	PM					
	CONE DIA.	V. C. DIA.				
SP2A	9 1/2"	3/4"	② ③			
B						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	WESTING-HOUSE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1 L2	.119A	260Ω	8.5 Henries	V-5921 V-6516 ④	C-1001 Ⓑ	C-2993 Ⓑ	R-8120	Ⓑ Drill one new mounting hole. ④ Used with models having PM speakers.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	WESTINGHOUSE PART No.	MEISSNER PART No.	
L3	Ant. Input	.2Ω CT				Part of tuner.
L4	Fil. Choke	0Ω				Part of tuner.
L5	Fil. Choke	0Ω				Part of tuner.
L6	Fil. Choke	0Ω				Part of tuner.
L7	1st Video IF	.1Ω	0Ω	V-5905-1		
L8	Fil. Choke	1Ω		V-4886-1		
L9	2nd Video IF and Sound Take-Off	.1Ω		V-5903-2		
L10	Fil. Choke	1Ω		V-4886-1		
L11	3rd Video IF	.1Ω	0Ω	V-5905-2		
L12	Fil. Choke	1Ω		V-4886-1		
L13	4th Video IF	.1Ω	0Ω	V-5905-3		
L14	Fil. Choke	1Ω		V-4886-1		
L15	Cath. Trap	0Ω	0Ω	V-5899		
L16	5th Video IF	.1Ω		V-5903-2		
L17	Peaking	4.8Ω		V-5902-2		Inductance-115 microhenries
L18	Peaking	5.5Ω		V-5902-1		Inductance-140 microhenries
L19	Peaking	4.8Ω		V-5902-2		Inductance-115 microhenries
L20	Peaking	4.8Ω		V-5902-2		Inductance-115 microhenries
L21	Peaking	5.5Ω		V-5902-1		Inductance-140 microhenries
L22	1st Sound IF	.2Ω		V-5932		
L23	2nd Sound IF	.2Ω	.2Ω	V-5933		
L24	Ratio Det. Transformer	.2Ω	0Ω	V-5939		
L25	RF Choke					
L26	Width Cont.	.3Ω		V-5904		
L27	Hor. Linearity	35Ω		V-5901		

MISCELLANEOUS

ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M1	RF Tuner	V-5941-1	Less tubes
M2	Ion Trap	V-5940	Permanent magnet type
M3	Fuse	V-6171-3	.25A 250V
	Knob	V-4382-4	On-Off Tone, Hor. Hold
	Knob	V-5028-3	Volume, Vert. Hold
	Knob Assembly	V-5039-2	Brightness, Contrast Models using brown rear knobs
	Knob Assembly	V-7878	Fine Tuning
	Knob Assembly	V-7879	Channel Selector
	Knob	V-6146-1	On-Off Tone, Hor. Hold
	Knob	V-6146-5	Brightness, Contrast, Front
	Knob	V-6147-1	Volume, Vert. Hold, Rear Models using brass rear knobs
	Knob	V-6245-1	Brightness, Contrast, Rear
	Knob Assembly	V-7892	Fine Tuning
	Knob Assembly	V-7893	Channel Selector
	Channel Indicator	V-6037	Used on sets having brown rear knobs
	Channel Indicator	V-6308-1	Used on sets having brass rear knobs
	Cabinet	V-1166-1	Mahogany
	Cabinet	V-1166-2	Blonde

WESTINGHOUSE MODELS H-196A (DX), H-207A (DX), H-207B (DX), H-225 (DX)

RADIO **PARTS LIST AND DESCRIPTIONS**

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		WESTINGHOUSE PART No.	STANDARD REPLACEMENT		
V29	FM RF Amp. - Mixer	12AT7	12AT7	9A	
V30	FM Osc. -AM Conv.	6BE6	6BE6	7CH	
V31	1st IF Amp.	6BA6	6BA6	7BK	
V32	FM 2nd IF Amp.	6BA6	6BA6	7BK	
V33	Ratio Det.	6AL5	6AL5	6BT	
V34	DET. -AVC-AF Amp.	6AV6	6AV6	7BT	
V35	Power Output	6V6GT	6V6GT	7AC	
V36	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C120A	20	400	V-6121	AF444J4A	UP22245C		EL-442	▲ Filter
B	20	400						■ Filter
C	10	350						▲ Decoupling
D	25	25						Output Cathode Bypass
C121	4	450	V-4885	PRS150/4	BR445		UT-4	Stabilizing Cap.
C122	100		R3CC30SL101M	1468-0001	5W5T1	GP1K-100	1FM-31	Ant. Coupling
C123	5000		V-5596	1467-005	1D5D5	811-005	29C1	RF Cathode Bypass
C124	33		R3CC26CK330M	1468-00004	5W5Q4	GP1K-33	1FM-44	RF Coupling
C125	33		R3CC26CK330M	1468-00004	5W5Q4	GP1K-33	1FM-44	RF Coupling
C126	5000		V-5596	1467-005	1D5D5	811-005	29C1	AVC Filter
C127	470		R5CC21ZY471M	1468-0005	5W5T5	GP2K-470	1FM-35	AVC Filter
C128	5000		V-5596	1467-005	1D5D5	811-005	29C1	Mixer Decoupling
C129	100		R3CC30SL101J	1469-0001	5R5T1	NPOM-100	MS-31	Fixed Trimmer
C130	2		R2CC30CK020D					Osc. Coupling
C131	470		R5CC21ZY471M	1468-0005	5W5T5	GP2K-470	1FM-35	RF Coupling
C132	5000		V-5596	1467-005	1D5D5	811-005	29C1	RF Plate Decoupling
C133	27		R3CC30CK270K	1468-000025	5W5Q25	GP1K-27	MS-425	Osc. Grid Cap.
C134	5		R2CC30CK050D	1469-000005	5R5V5	NPOK-5	MS-55	Osc. Feedback
C135	470		R5CC21ZY471M	1468-0005	5W5T5	GP2K-470	1FM-35	RF Bypass
C136	2		R2CC30UK020D					Fixed Trimmer
C137	5000		V-5596	1467-005	1D5D5	811-005	29C1	AVC Filter
C138	5000		V-5596	1467-005	1D5D5	811-005	29C1	Conv. Filament Bypass
C139	5000		V-5596	1467-005	1D5D5	811-005	29C1	Conv. Plate Decoupling
C140	.02	200	RCP10W2203A	P488-02	GT2S2		TM-12	AVC Filter
C141	5000		V-5596	1467-005	1D5D5	811-005	29C1	1st IF Cath. Bypass
C142	5000		V-5596	1467-005	1D5D5	811-005	29C1	1st IF Screen Bypass
C143	5000		V-5596	1467-005	1D5D5	811-005	29C1	1st IF Plate Decoupling
C144	100	500	RCM20A101M	1468-0001	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C145	100	500	RCM20A101M	1468-0001	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C146	5000		V-5596	1467-005	1D5D5	811-005	29C1	2nd IF Cathode Bypass
C147	5000		V-5596	1467-005	1D5D5	811-005	29C1	2nd IF Screen Bypass
C148	5000		V-5596	1467-005	1D5D5	811-005	29C1	2nd IF Plate Decoupling
C149	150	500	RCM20A151J	1468-00015	5W5T15	GP2K-150	1FM-315	Diode Load Cap. *
C150	150	500	RCM20A151J	1468-00015	5W5T15	GP2K-150	1FM-315	Diode Load Cap. *
C151	.01	200	V-5040-13	P488-01	GT2S1	GP2-335-01	TM-11	DAVC Decoupling
C152	.002	600	RCP10W6202A	P688-002	GT6D2	GP2M-002	TM-22	De-emphasis
C153	.01	400	RCP10W4103A	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C154	470	500	RCM20A471M	1468-0005	5W5T5	GP2K-470	1FM-35	Tone Compensation
C155	.05	200	RCP10W2503A	P288-05	GT2S5		TM-15	Tone Compensation
C156	.01	400	RCP10W4103A	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C157	150	500	RCM20A151M	1468-00015	5W5T15	GP2K-150	1FM-315	AF Plate Bypass
C158	.03	400	RCP10W4303A	P488-03	GT4S3		TM-13	AF Plate Decoupling
C159	680	500	RCM20A681M	1468-00075	1W5T7	GP2K-680	1FM-37	Tone Compensation
C160	.01	400	RCP10W4103A	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C161	.005	600	RCP10M6502A	P688-005	GT6D5	GP2M-005	TM-25	Output Plate Bypass
C162	.01	200	V-5040-13	P488-01	GT2S1	GP2-335-01	TM-11	Filament Bypass

* When either item C149 or C150 are replaced, replace both with capacitors of equal value.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	WESTINGHOUSE PART No.	IRC PART No.	CLAROSTAT PART No.	
R131A	500KΩ	½	V-6122	B18-133X *	V-6122	Volume control, front, tapped at 50KΩ
B	2 Meg.	½		B11-139 *		Tone control, rear
C	Shaft End			E202 *		Attach per instructions in "Concentrikit"
D	Switch			76-1 *		Attach per instructions in "Concentrikit"

* Additional parts to be used with "Concentrikit"

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	WESTINGHOUSE PART No.	IRC PART No.	
R132	82Ω	1/2	RC10AE820K		FM RF Cathode
R133	15Ω	1/2	RC10AE150M		Parasitic Supp.
R134	470KΩ	1/2	RC10AE474M	BTS-470K	FM RF Grid
R135	2.2 Meg.	1/2	RC10AE225M	BTS-2.2 Meg.	AVC Network
R136	5600Ω	1	RC30AE562K	BTA-5600	FM RF Plate
R137	470KΩ	1/2	RC10AE474M	BTS-470K	Mixer Grid
R138	1000Ω	1/2	RC10AE102M	BTS-1000	Mixer Plate Decoupling
R139	4700Ω	1/2	RC10AE472M	BTS-4700	Conv. Plate Decoupling
R140	12KΩ	2	RC41AE123K	BT-2-12K	Osc. Anode
R141	22KΩ	1/2	RC10AE223K	BTS-22K	Osc. Grid
R142	1 Meg.	1/2	RC10AE105M	BTS-1 Meg.	AVC Network
R143	1 Meg.	1/2	RC10AE105M	BTS-1 Meg.	AVC Network
R144	2200Ω	1/2	RC10AE222K	BTS-2200	Ant. Loading
R145	68Ω	1/2	RC10AE680K		1st IF Cathode
R146	33KΩ	1	RC30AE333K	BTA-33K	1st IF Screen
R147	3300Ω	1	RC30AE332K	BTA-3300	1st IF Plate Decoupling
R148	47KΩ	1/2	RC10AE473M	BTS-47K	Diode Filter
R149	2.2 Meg.	1/2	RC10AE225M	BTS-2.2 Meg.	Diode Load
R150	68Ω	1/2	RC10AE680K		2nd FM IF Cathode
R151	33KΩ	1	RC30AE333K	BTA-33K	2nd FM IF Screen
R152	3300Ω	1	RC30AE332K	BTA-3300	2nd FM IF Plate Decoupling
R153	220Ω	1/2	RC10AE221M	BW-1/2-220	Balancing
R154	15KΩ	1/2	RC10AE153K	BTS-15K	Ratio Det. Diode Load
R155	47KΩ	1/2	RC10AE473M	BTS-47K	De-emphasis
R156	220KΩ	1/2	RC10AE224M	BTS-220K	AVC Network
R157	3.3 Meg.	1/2	RC10AE335M	BTS-3.3 Meg.	Delayed AVC
R158	1500Ω	1/2	RC10AE152M	BTS-1500	Tone Compensation
R159	10 Meg.	1/2	RC10AE106M	BTS-10 Meg.	AF Grid
R160	470KΩ	1/2	RC10AE474M	BTS-470K	AF Plate
R161	150KΩ	1/2	RC10AE154M	BTS-150K	AF Plate Decoupling
R162	470KΩ	1/2	RC10AE474M	BTS-470K	Output Grid
R163	270Ω	1	RC30AE271K	BW-1-270	Output Cathode

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	WESTINGHOUSE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T9	117VAC at .76A	590VCT at .114 ADC	5VAC at 2A	6.3VAC at 2.5A	V-6131	P-6312 ⑨	P-2952 ⑨ ⑩	PV-120

⑨ Mount vertically with universal mounting brackets.
⑩ Add series resistor to reduce plate voltage.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		WESTING-HOUSE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T10	4.8KΩ	3.6Ω	400Ω	.4Ω	V-5798	A-3823	A-2930	RO-9 ⑧	⑧ Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	WESTING-HOUSE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L28	.114ADC	240Ω	5.5 Henries	V-6161				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	WESTINGHOUSE PART No.	MEISSNER PART No.	
L29	Loop Ant.	0Ω		V-5982-2		Three Turns Around Cabinet
L30	Loop Loading	2Ω		V-6157		
L31	FM Dipole Ant.	0Ω		V-5986-3		
L32	RF Choke	0Ω		V-4886-10		Wound on resistor
L33	FM Ant.	0Ω		V-6139		
L34	FM Osc.	0Ω		V-6138		
L35	AM Osc.	9Ω		V-6164		
L36	Parasitic Supp.	0Ω		V-4886-6		Wound on 820Ω resistor.
L37	RF Choke	1.5Ω		V-4886-4		
L38	Parasitic Supp.	0Ω		V-4886-7		Wound on 22Ω resistor
L39	RF Choke	.5Ω		V-4886-2		
L40	1st FM IF	.5Ω	.5Ω	V-6142		
L41	1st AM IF	16Ω	16Ω	V-6130		
L42	2nd FM IF	.5Ω	.5Ω	V-6129		
L43	2nd AM IF	16Ω	16Ω	V-6130		
L44	Ratio Det. Transformer	1Ω	0Ω	V-6128		
L45	Fil. Choke	.5Ω		V-4886-2		
L46	Fil. Choke	.5Ω		V-4886-2		
L47	Fil. Choke	1Ω		V-4886-1		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	WESTINGHOUSE PART No.	JENSEN PART No.	QUAM PART No.	
SP3	PM	3.3Ω	V-5571	ST-119 (12) MOD.P10-T	10A31	(12) Replace output transformer to match 6-8Ω voice coil.
	CONE DIA.	V. C. DIA.				
SP4	9 1/2"	3/4"				

DIAL LIGHTS

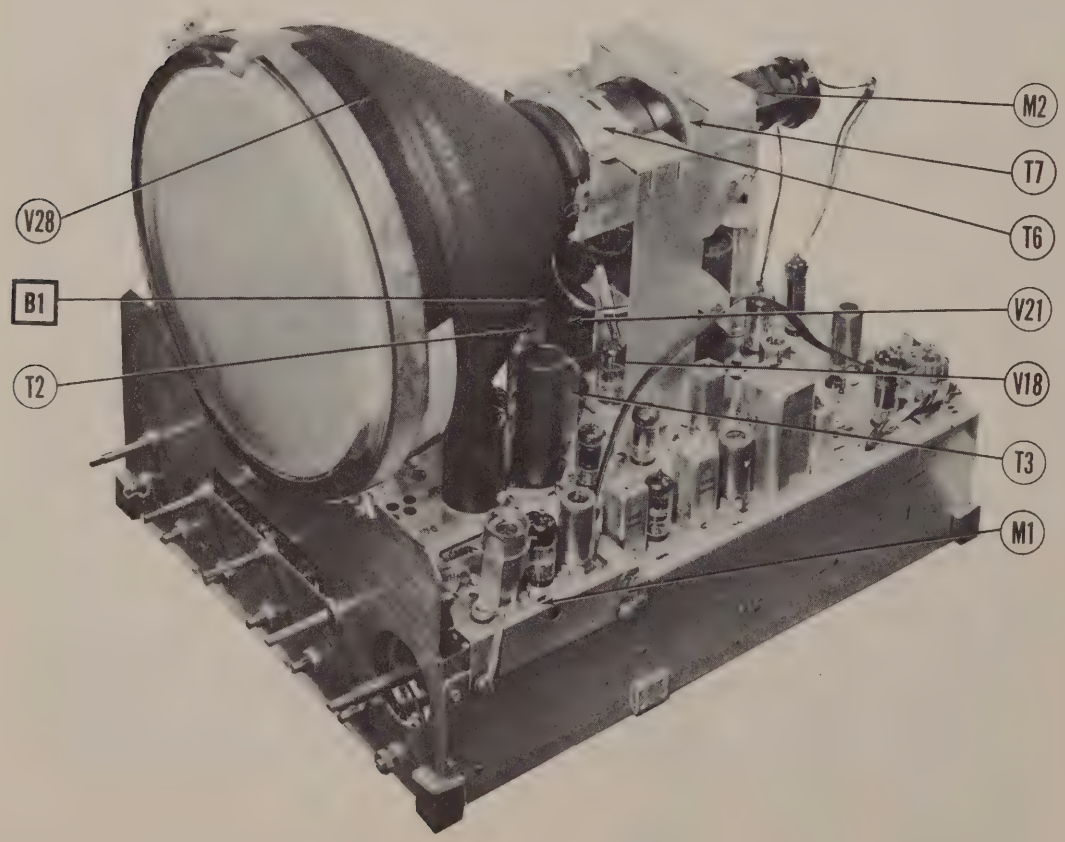
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA WESTINGHOUSE PART No.		NOTES
M4	Bayonet	6-8	.15	Brown	47		Type #47
M5	Bayonet	6-8	.15	Brown	47		Type #47

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Westinghouse PART No.	ASTATIC PART No.	REMARKS
M6		LQD-1	

MISCELLANEOUS

ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M8	Switch	V-6140	Band
M9	Tuning Cap.	V-6137	AM-Two Gang (48-552MMF, 37-212MMF)
	Dial	V-6123	
	Dial Pointer	V-6125	



CHASSIS-TOP VIEW

SENSITIVITY CONTROL ADJUSTMENTS

For average conditions, this control may be set as follows:

1. Disconnect antenna from receiver.
2. Connect VTVM from AGC line to chassis.
3. Turn sensitivity control fully clockwise.
4. Now slowly turn the control counter-clockwise until VTVM reading decreases to 0.6 volt.
5. If voltage will not decrease to 0.6 volt turn control to the point where the voltage stops decreasing.

Another method of adjustment is as follows:

1. Disconnect antenna from receiver.
2. Turn contrast control fully clockwise.
3. Turn brightness control just to the point where the raster appears.
4. Turn the sensitivity control fully counter-clockwise and notice the black noise dots which appear on the raster.
5. Slowly turn the sensitivity control clockwise to the point when the noise dots disappear.
6. Back up the control to point where the noise dots reappear.

The two methods outlined above are for average conditions. For extremely weak or strong signals this control should be adjusted for best picture quality on all available stations.

HORIZONTAL OSCILLATOR ALIGNMENT

Turn the set on and tune in a TV station. Turn the vertical hold control to synchronize the picture vertically. Turn the horizontal hold control to the mid-position of its range.

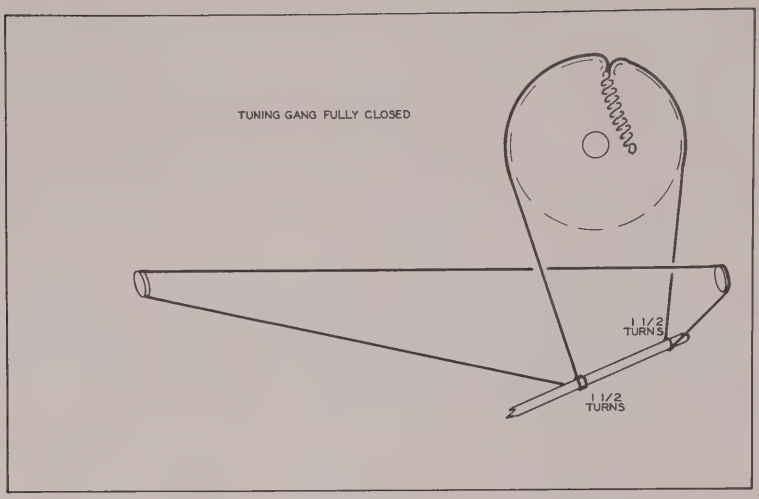
Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. Adjust the phasing slug (B2) until the blanking bar, which may appear in the picture, moves to the right and off the raster.

HORIZONTAL LINEARITY ADJUSTMENT

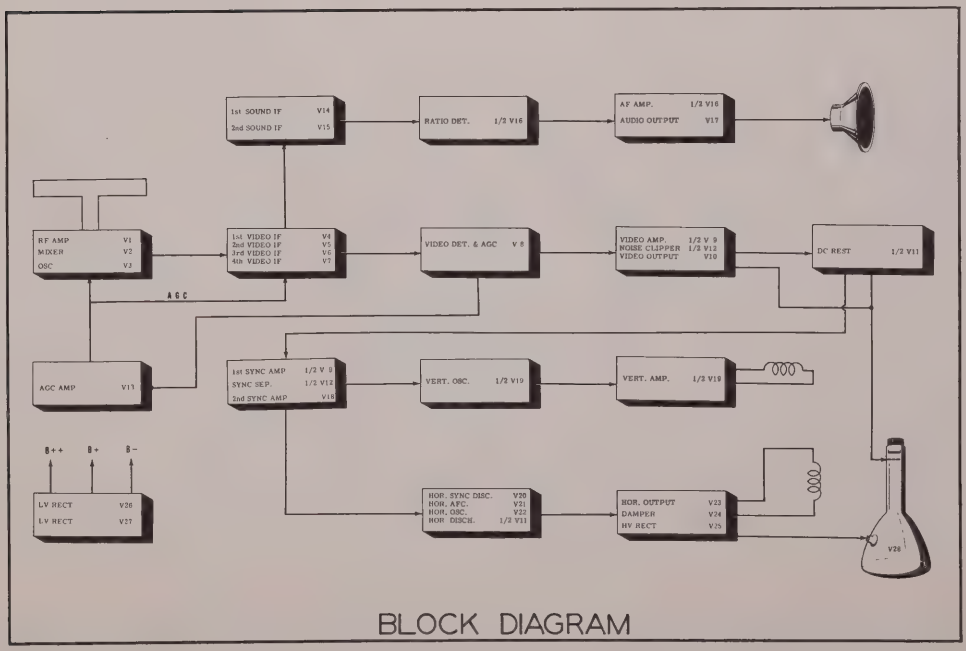
Adjust the width slug (B3) until the picture is of proper size to fill the mask horizontally. Adjust the horizontal linearity slug (B4) and the horizontal linearity control until the picture is symmetrical from left to right. The horizontal linearity control effects mainly the right half of the picture, and B4 effects the center of the picture. These two adjustments should be made alternately for best results.

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push-on type control knobs from TV.
2. Remove 12 screws holding rear cover. Pull out on left side, push up and remove cover.
3. Remove speaker plug from TV speaker.
4. Remove three 7/16" hex head bolts holding TV chassis. Remove chassis.
5. Remove four screws holding TV speaker. Remove speaker.
6. Remove two push-on type control knobs from receiver.
7. Disconnect phono motor and pick-up plugs from rear of receiver chassis.
8. Disconnect receiver power plug from under TV mounting board.
9. Remove AM and FM antenna leads from terminals on rear of receiver chassis.
10. Remove speaker leads from top of receiver chassis.
11. Remove three 1/4" hex head bolts holding receiver chassis. Remove chassis.
12. Remove five screws holding speaker. Remove speaker.

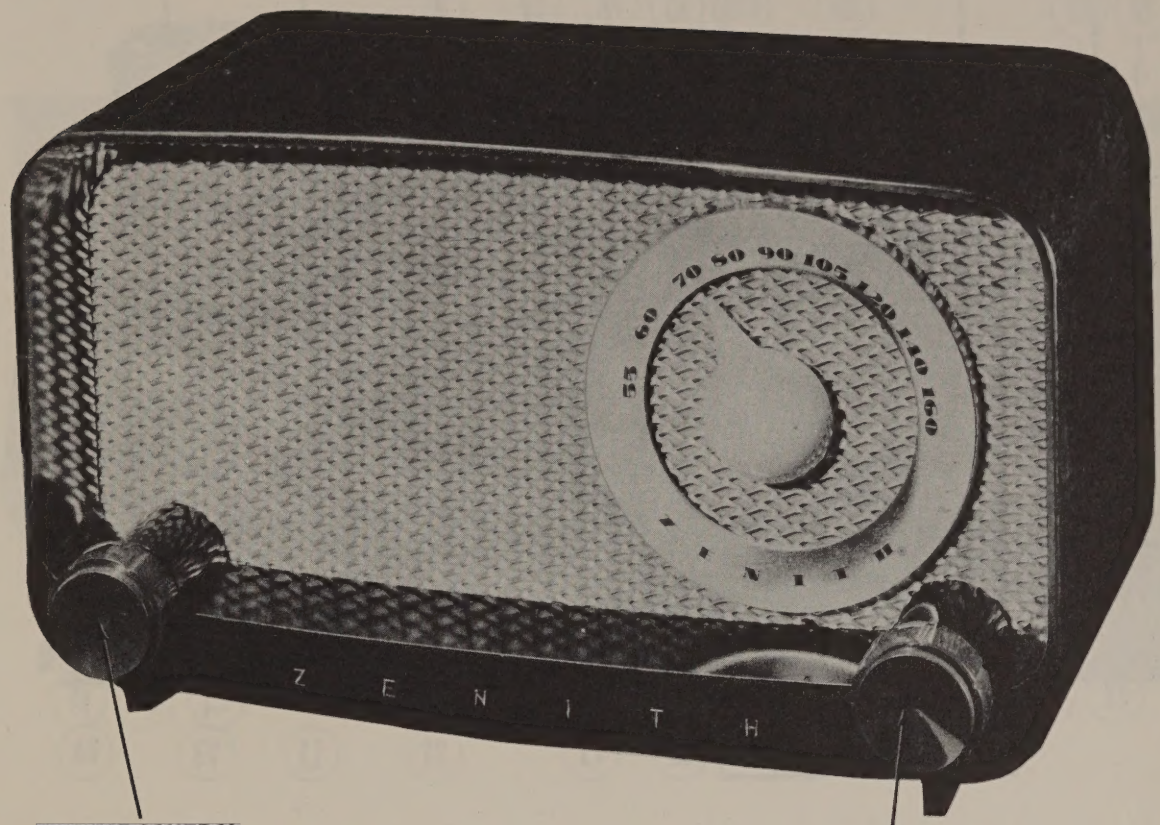


DIAL CORD DRIVE



BLOCK DIAGRAM

ZENITH MODELS G510, G510Y (Ch. 5G02)



ZENITH MODELS G510, G510Y (Ch. 5G02)

TRADE NAME	Zenith Model G510, G510Y (Chassis 5G02)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 50L6GT Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING:	.260 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer parallel with base of dial.

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.5MFD	High side to stator of rear section of tuning gang. Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Ac ross voice coil	A1, A2, A3, A4	Adjust or maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	DET.-AVC-AF	12AT6	12AT6	7BT	
V4	Power Output	50L6GT	50L6GT	7AC	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	150	22-1804	AF844D*	UP42215*		EL-224*	■ Filter
B	20	150						▲ Filter
C2	.05	200	22-829	P288-05	PTE4S5		TM-15	AVC Filter
C3	110		22-5	1468-0001	5W5T1	GP1K-100	1FM-31	Osc. Grid Cap.
C4	.01	600	22-196	P688-01	PTE6S1	821-01	TM-11	Audio Coupling
C5A	500		105-15	1468-0005	5W5T5	GP2K-500	1FM-25	AF Plate Bypass
B	7000			P488-0068	PTE6D6	GP2M-0068	TM-26	Audio Coupling
C6	.02	400	22-1379	P488-02	PTE4S2		TM-12	Output Plate Bypass
C7	.05	200	22-829	P288-05	PTE4S5		72P51	Line Isolation
C8	.05	400	22-1017	P488-05	PTE4S5		TM-15	Line Filter

* Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	63-1660	Q11-137	AM-61-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Attach to R1A per instructions

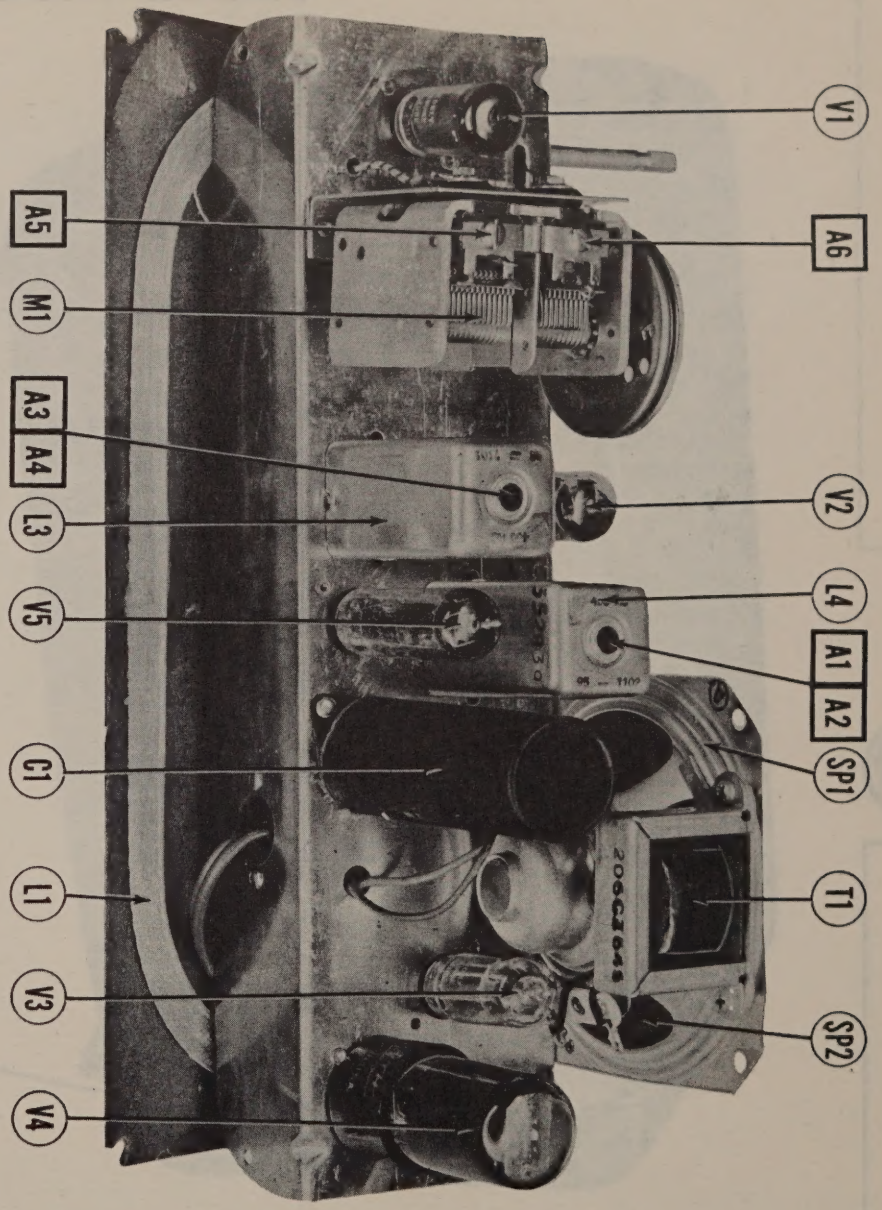
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	IDENTIFICATION CODES
R2	10KΩ	½	63-1828	BTS-10K	Osc. Grid
R3	68Ω	½	63-1737	BW-½-68	IF Cathode-Wire Wound
R4	2.2 Meg.	½	63-1926	BTS-2.2 Meg.	AVC Network
R5	4.7 Meg.	½	63-1940	BTS-4.7 Meg.	AF Grid
R6	470KΩ	½	63-1898	BTS-470K	AF Plate
R7	470KΩ	½	63-1898	BTS-470K	Output Grid
R8	150Ω	1	63-1977	BW-1-150	Output Cathode
R9	1000Ω	1	63-1574	BW-1-1000	Filter
R10	22Ω	½	63-1219		Surge Limiter-Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2000Ω	3.3Ω	180Ω	.5Ω	206-645	A-3876	A-2928	RO-2	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

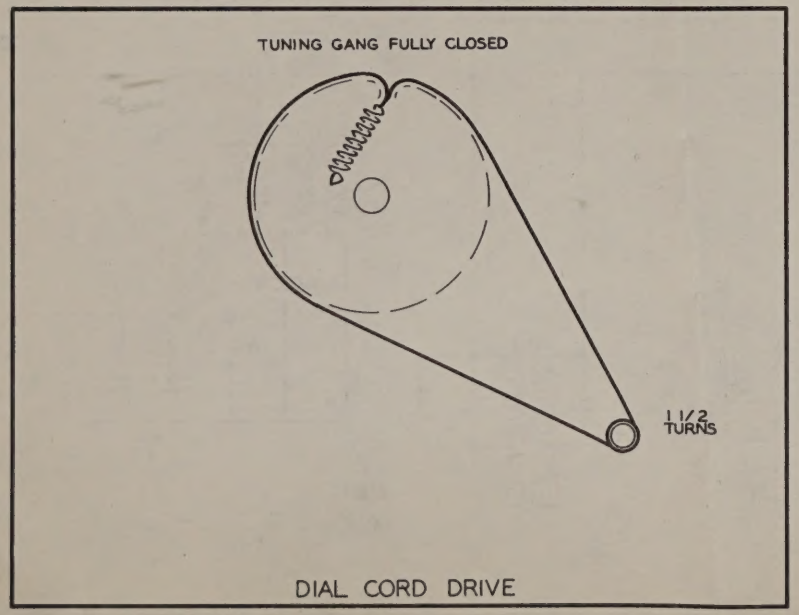
ITEM No.	RATINGS		REPLACEMENT DATA ZENITH PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113 ¶		
SP1	PM	3.5Ω	49-645	MOD. P4-X	4A07 ¶	¶ Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"	208-645			

R F COILS

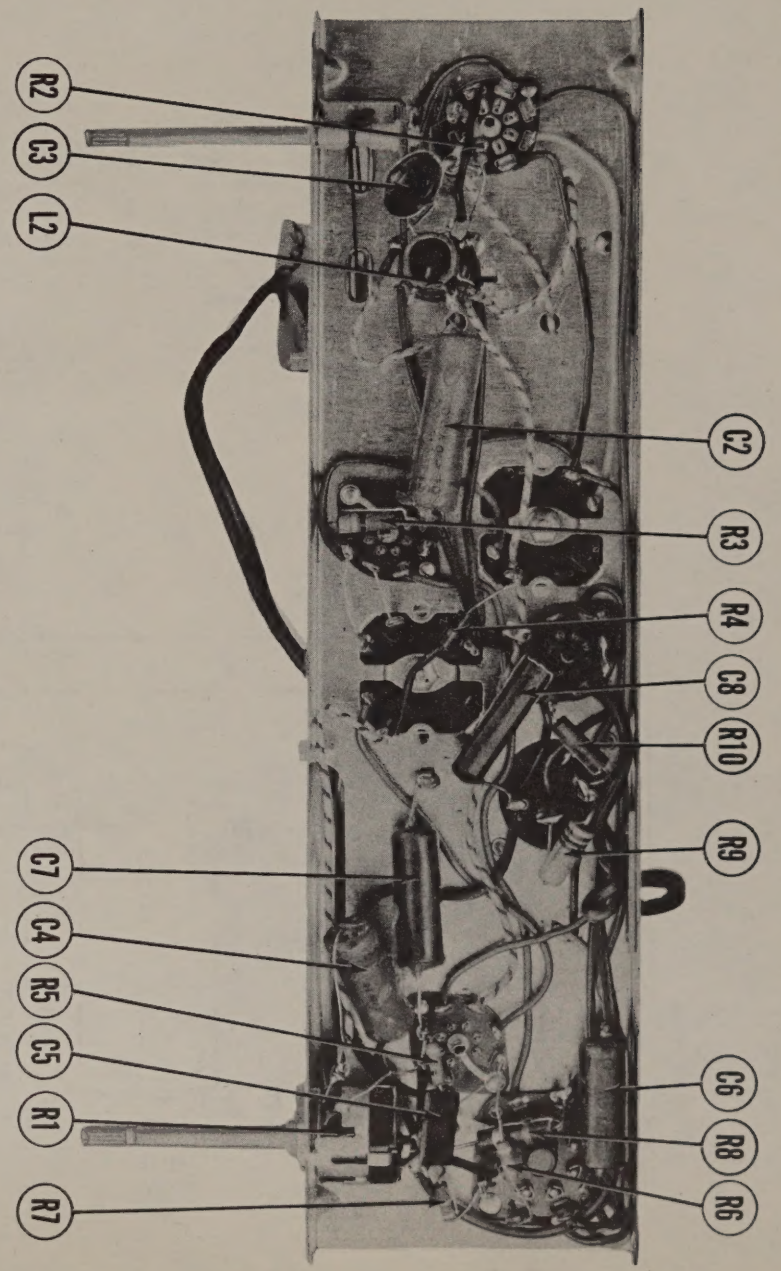
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA MEISSNER PART No.
L1	Loop Ant.	2.5Ω		S-14879	
L2	Osc. Coil	.6Ω	5Ω	S-14842	14-1060
L3	Input IF	20Ω	20Ω	95-1101	16-6666
L4	Output IF	20.5Ω	20.5Ω	95-1102	16-6670

MISCELLANEOUS

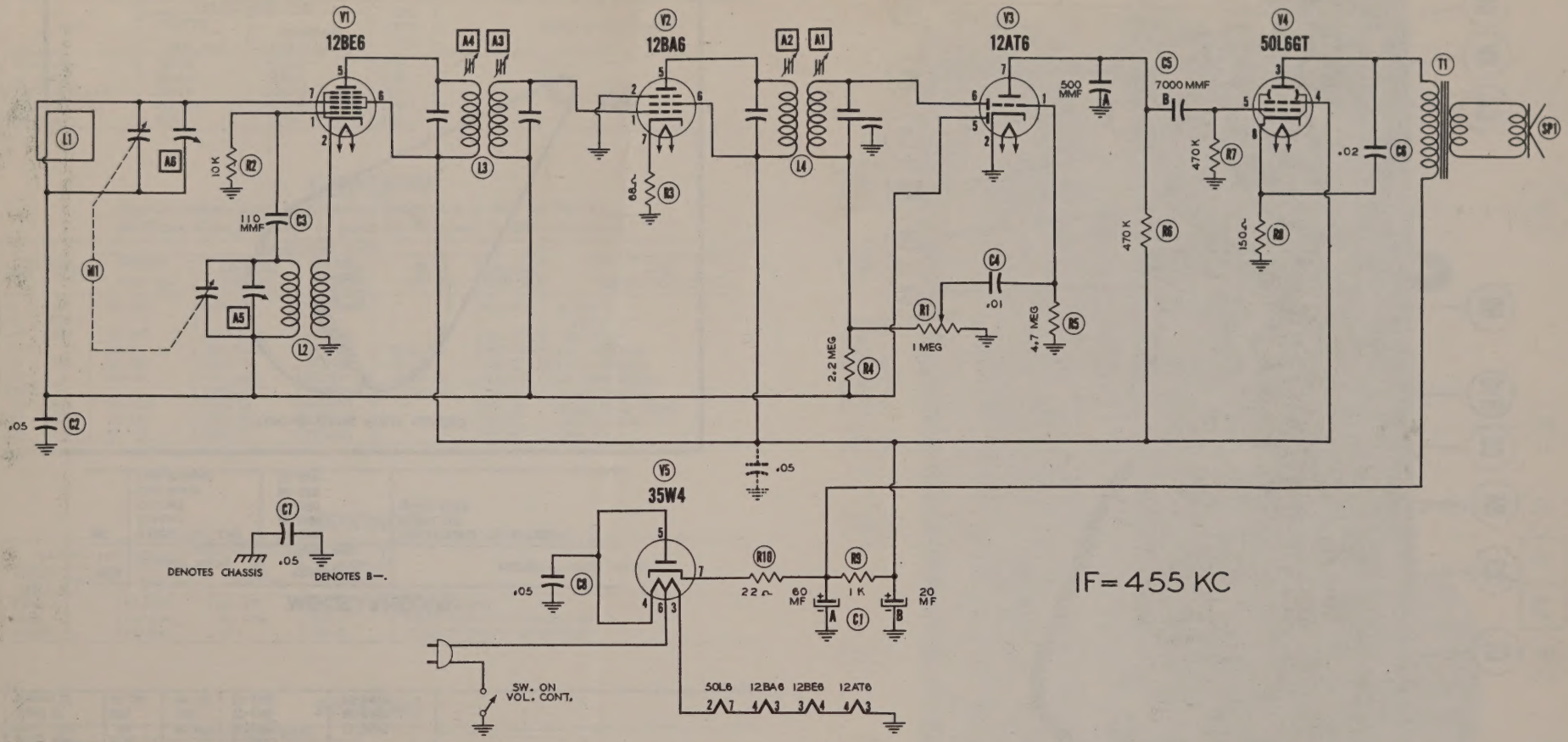
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M1	2 Gang Var. Cap	22-2152	(33-467MMF, 35-207MMF)
	Cabinet	14-1209	Model 510
	Cabinet	14-1010	Model 510Y
	Dial Scale	26-432	
	Dial Pointer	59-236	



CHASSIS—BOTTOM VIEW



ZENITH MODEL G510



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BE6	§-3.5VDC	0V	24VAC	12VAC	85VDC	85VDC	.8VDC	
V 2	12BA6	-.5VDC	0V	24VAC	36VAC	85VDC	85VDC	.9VDC	
V 3	12AT6	-.4VDC	0V	0V	12VAC	-.5VDC	-.6VDC	50VDC	
V 4	50L6GT	0V	90VAC	110VDC	85VDC	0V	0V	38VAC	5.7VDC
V 5	35W4	0V	0V	90VAC	115VAC	115VAC	117VAC	120VDC	

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BE6	10KΩ	.5Ω	24Ω	12Ω	†1000Ω	†1000Ω	3.2 Meg.	
V 2	12BA6	20Ω	0Ω	24Ω	36Ω	†1000Ω	†1000Ω	68Ω	
V 3	12AT6	4.7 Meg.	0Ω	0Ω	12Ω	3.2 Meg.	1 Meg.	†470KΩ	
V 4	50L6GT	0Ω	85Ω	†200Ω	†1000Ω	470KΩ	Inf.	36Ω	150Ω
V 5	35W4	Inf.	Inf.	85Ω	112Ω	112Ω	110Ω	50KΩ	

† MEASURED FROM PIN 7 OF V5

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.